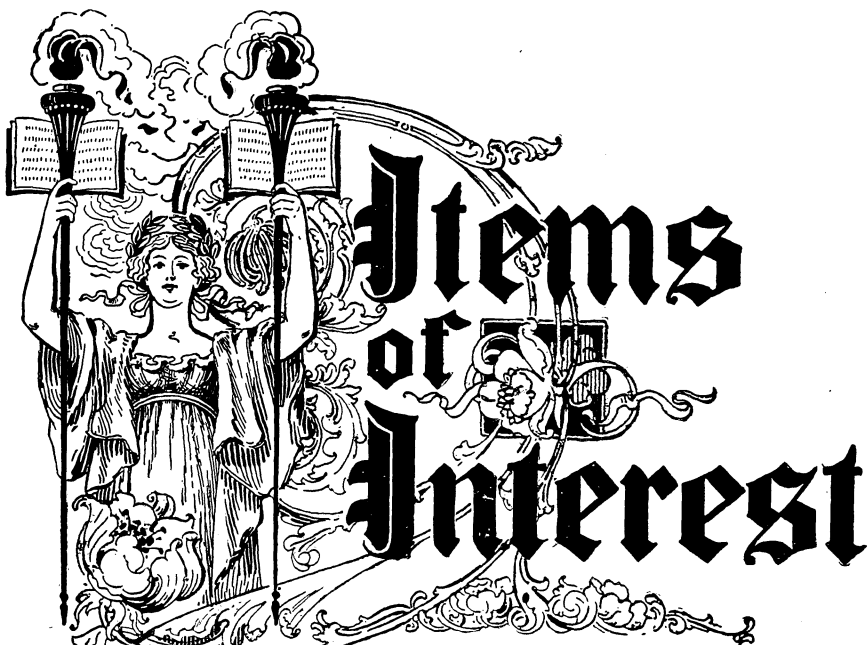


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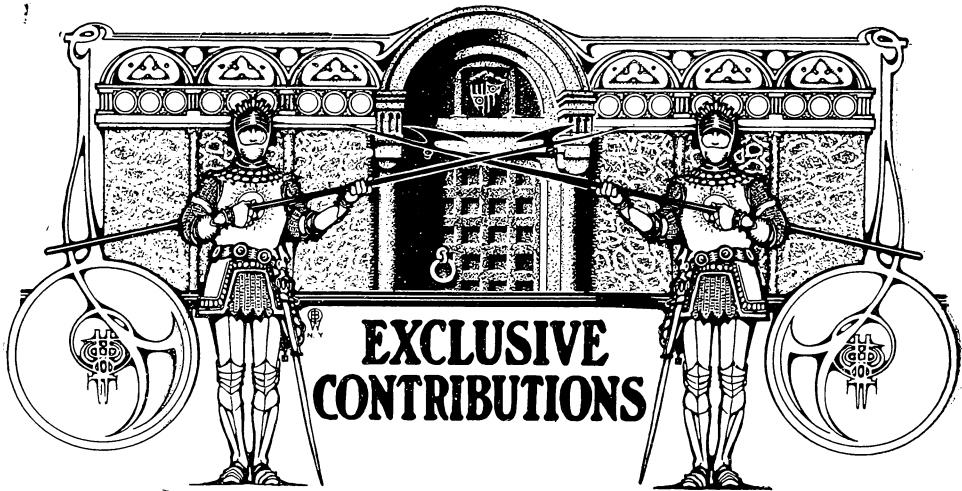
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DR. J. FOSTER FLAGG.



The Finsen Light Cure.

By H. JOHN STEWART, M.D., Chicago, Ill.

Having read and heard so much about the Finsen Light treatment in the cure of disease, I decided in April of this year to make a personal investigation to see and learn for myself if it be true that such diseases as lupus and rodent ulcer could be cured by light. I visited several institutions where the Finsen lamp was in operation. In Manchester, England, in the Salford skin hospital, they had a Finsen Light department under the supervision of Prof. Brooke, who informed me they were unable to treat half the sufferers who applied for treatment, and they had solicited by public subscription \$125,000 for the erection of a new hospital for skin diseases, where they would be able to enlarge the "light department" so that at least 200 people might be treated daily, as there were people on their waiting list whom they would be unable to treat, with their present facilities, for an indefinite time. Prof. Brooke was most enthusiastic over the wonderful results they were obtaining there.

I next visited the London general hospital of London, England, and found they were just completing an immense light department, that had been established by the present Queen of England, then Princess of Wales, in 1900, who presented the first lamp at that time; and as it was found to be far too inadequate, she had just given a second lamp, and Alfred Harmsworth had also given \$50,000 for the perpetual endowment of another Finsen lamp in this department, and they were then building a platform to receive the King and Queen, whom they expected to come

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June 11 to dedicate this new department; and even with these increased facilities I was informed by Prof. Sequirey there were patients on the waiting list who were unable to receive treatments.

I next visited the Light Institute at Copenhagen and found that all the statements that had been made regarding it were not in the least exaggerated. I had the pleasure of meeting and studying under Prof. Finsen himself and was extended every courtesy by Prof. Finsen and his assistants at this institution. He seemed very much pleased to describe in the minutest detail the apparatus, treatment, etc., and gave me a detailed history of the Finsen Light.

The Finsen Light. The Finsen Light is a large specially constructed arc lamp of 20,000 candle power, or twenty times stronger than an ordinary street lamp, and uses from sixty to eighty amperes of current. This lamp burns a specially made carbon which can only be procured at Copenhagen. In the upper holder is a large carbon, while a smaller one is used in the bottom holder; when properly adjusted for arcing a maximum number of violet and ultra violet rays are produced. The advantage of the Finsen lamp over others is in the greater number of violet rays produced. The Finsen lamp produces a much greater number of chemical rays than sunlight, as the atmosphere absorbs a large percentage of these rays. The light is so intense it is impossible to look at it with the naked eye, and it is necessary for all the attendants and patients to wear dense smoked glasses while the lamp is in operation. An aluminum hood about two feet wide surrounds the lamp, which hood is fringed on its lower border with a deep crimson-colored paper skirt to further aid in excluding the diffused light from the patients.

The concentrated rays are carried from the arc to the patients through four telescopic tubes, known as converging tubes, suspended at an angle of forty-five degrees, the tubes containing a series of rock crystal lenses so arranged that reservoirs for running water exists between them. By means of the water screen and rock crystal lenses, all rays but the violet are eliminated, and these rays are converged and concentrated, thus vastly increasing the healing and bactericidal effects.

The heat from the original arc is so intense that to prevent cracking of the lenses and discomfort to the patients, a stream of cold water is kept constantly circulating through the reservoirs or water screens.

To further concentrate and cool the rays a compressor is provided which consists of two rock crystal lenses so arranged that a chamber for running water exists between them. This part of the apparatus is used to compress the affected area and make it bloodless during the treatment, thus facilitating deeper penetration. The Finsen arc light has been used

EXCLUSIVE CONTRIBUTIONS

with marked success in curing many skin diseases, thought until this time incurable, especially Lupus and rodent ulcer. During a period of six years the Finsen Medical Light Institute at Copenhagen has grown from a very small shed, where they were only able to treat one patient at a time, to a magnificent institution, where they are now treating three hundred people daily, and light institutes have been established in London, England; St. Petersburg, Russia; Paris, France; and Chicago, Illinois, where they are all carrying on a similar work to the parent institution.

Lupus. It has been a popular belief that lupus is a very rare disease, common only in the Northern countries; and although it was supposed there was no lupus

in London, yet the hospitals are now treating 175 daily, and the management was compelled to install two more lamps and build a separate department so great has been the demand from people seeking relief. Lupus was considered very rare in the United States, but since the establishment of the Finsen Light Institute in Chicago the author is informed they have been taxed to their utmost capacity, and they, too, have found it necessary to increase their facilities, as there are now patients on the waiting list who are not able to receive treatment. It seems but a question of a short time until light institutes will be established in every large city in America, because it has proven so efficacious in many other skin diseases besides lupus and rodent ulcer, such as acne, alopecia-areata, localized eczema, chronic ulcers and nevus.

Treatment. The treatments are given while the patients recline on couches. By firm pressure with the compressors on the tissue to be treated, the blood is removed and more heat can be borne and deeper penetration produced. This compression has another important advantage in that the bactericidal effect is greater because it has been shown that the corpuscles absorb a considerable portion of the rays and thus prevent deep penetration.

The affected area is placed about ten inches from the distal end of the converging apparatus and the treatments, or seances, as they are called, take about one hour daily in lupus and rodent ulcer, and in other skin diseases from ten to twenty minutes, depending upon each individual case.

The results attained have been hardly less than marvelous since from carefully compiled statistics covering a series of over 800 cases of lupus treated at the Finsen Institute an overwhelming percentage of cures and an insignificant number of failures is shown, and Prof. Finsen goes so far as to say that in lupus-vulgaris cures can be obtained in 97 per cent of cases even where the whole face is involved. In these 800 patients, with ages ranging from 6 to 74 years, the average duration of disease



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was 11 years. This treatment has an advantage over the X-ray in that there is no danger of burning and consequent sloughing. With the light treatment we are dealing with a known quantity, while with the X-ray we have an unknown quantity with uncertain action.

The light treatment causes no pain; a red erythematous spot and blister appears where the light is applied, and in five or six days the scab falls off and the ulcer is healed beneath, and the skin is left free from scar or cicatrix but red; the redness, however, after a variable period, fades and leaves the skin white and uncontracted, except where there has been a loss of tissue from the disease before treatment.

In conclusion, the author would state that the possibilities for the light treatment in the curing of diseases are still unknown, and he believes that in a limited time it will take an exalted position in the field of medicine and surgery.

Maternal Psychism.

Its Effect Upon Dentition.

By M. N. FEDERSPIEL, D.D.S., Racine, Wis.

Upon entering the field of study in the line of dental cosmogony, which is outlined in the title of this paper, one is met with a difficulty such as does not confront us along any other line of research, because there is no scientific data on which to rely. We are compelled, therefore, to bring reason and logic to bear, and compare known facts regarding the power of a prospective mother's mentality as it operates upon the nascent form of her future offspring.

Bayer, U. S., has in his work on "Maternal Impressions" and in his latest study "Maternal Researches" given striking examples of the wonderful psychological power inherent in the prospective mother's mind. While making a careful study of the two works mentioned, I was strongly impressed with the conviction that if a woman can through a psychological influence deform other organs or processes of the body of her offspring, why not the jaws and other adjoining parts.

Before proceeding farther, it will be proper to quote from Bayer on "Maternal Impressions," or, as I prefer to call it, Maternal Psychism: "The fundamental idea of Maternal Impressions is that the mother's idiosyncrasies, her likes and dislikes, good or bad humor, gentle or ugly

and mean spirit affect the forming brain and body of her offspring, thus shaping its physiological structure, endowing it with characteristics which differ from its parent in accordance with the mother's mood, as she is different from her normal condition."

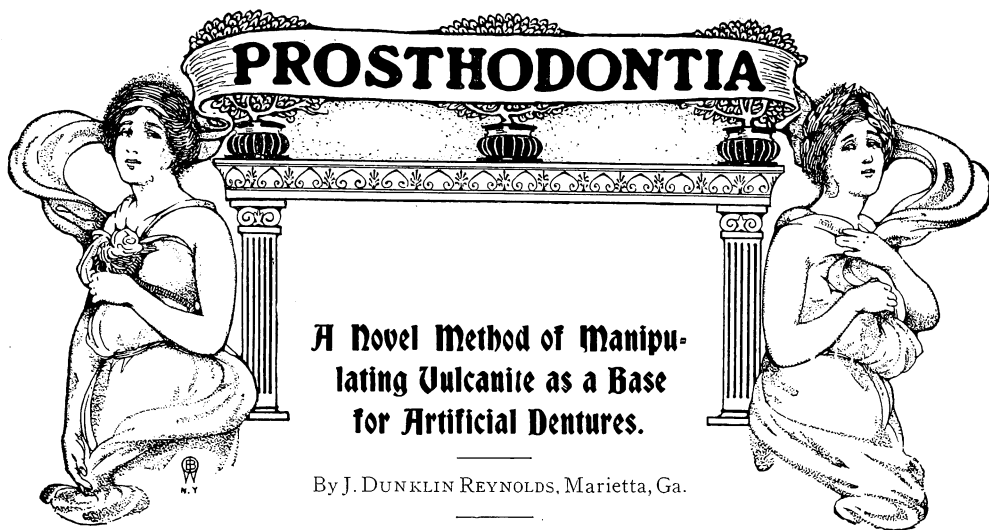
Mr. Bayer further says: "A careful study of the theory of Maternal Impressions, and the many facts in its favor, will convince the student that a prospective mother has the power to produce a brain and body such as she desires, limited only by her mentality and the limitations of nature, that is to say, a human mother cannot produce anything but a human being, or a semblance of humanity."

If it is true that a mother can produce physical deformities and that she can affect the nervous system of her offspring before its birth, then it must be that she forms the brain structure of her offspring, good or bad, and does it consciously or unconsciously.

If Mr. Bayer's ideas on Maternal Impressions be correct, then it necessarily follows that the dentition of an individual is also liable to be affected as is any other part of the organic structure, as all parts of the organism are governed by the same forces; acted upon in a favorable or unfavorable manner. It is therefore logical to assume that either or both the upper and the lower teeth are thus abnormally affected.

That hypothesis will clear the way for a more accurate theory of causation of that common bane of the dental surgeon's practice, viz.: cleft palate or hare-lip. Up to this time such defects have been inexplicable to the student of anatomy. It has usually been charged to arrested development, and the vast body of medical and surgical professors have been unable to clear up the mystery which surrounds that question. The dental surgeon has therefore accepted the arrested development theory, taking it for granted that there was no use for him to waste time and energy upon such subjects.

But now that Mr. Bayer has shown us the wide field the forces of Maternal Psychism embraces, and brings in the clear light of research, these cases are not so mysterious as they have been heretofore considered. While I admit that a knowledge of the causation of any defects of the teeth or jaws is not essential to successful removal of the abnormalities of that class, yet to the student of dentistry the light which is thrown upon any study pertaining in the least to his profession is welcome to dental practitioners who are always looking for more light.



In offering a description of this method of manipulating rubber as a base for artificial dentures, we claim no priority as to originality; but think the process is comparatively new to the majority of the profession, having seen very little literature on the subject, and think it worthy of investigation by those interested in prosthodontia.

The method is the application of unvulcanized sheet rubber directly to the model, eliminating the procedure of "setting up" the teeth in wax, flasking, separating and packing previous to vulcanizing the case.

For this purpose we have found the vulcanizable gutta percha sold by the depots to be the most satisfactory, although we have used ordinary red rubber No. 1, Improved, Bow Spring and others, in the same manner though some were more difficult to manipulate.

The model and bite are procured, and articulated in the usual way, proceeding as follows: The surface of the model to be covered with rubber is coated with a very thin solution of red rubber or vulcanizable gutta-percha dissolved in spirits of turpentine or gasoline, preferring the former as it presents a more tenacious surface; be careful to remove all surplus.

The application of this solution is particularly essential in "green" or fresh models, as the moisture contained in them prevents the close adherence of the rubber to the model.

The rubber is cut of a shape corresponding to that of the model, and warmed thoroughly over an alcohol lamp or Bunsen burner, being careful not to overheat or blister the surface of the rubber, and is pressed to place with the fingers on the model as though you were using wax.

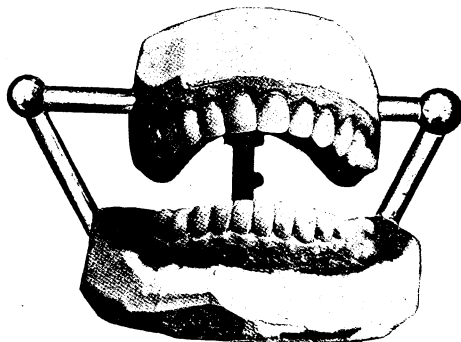
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This is built up and shaped properly to receive the teeth, either plain or gum section, as the case may be, which must be absolutely free from wax and clean otherwise.

The teeth are warmed and pressed to their proper articulated position in the rubber with the aid of a wax spatula and the fingers, which constitute all the instruments needed in this procedure.

After having articulated the teeth, the irregularities and rough places can be made smooth and equal by filling in with more rubber and working over with a warm spatula, when the case is ready to be "flasked," vulcanized and polished.

With a little experience, when plain teeth are used, pink rubber can be worked into the labial surface of the plate without the common danger of red rubber being forced through to the surface, as when the flask is packed and closed under pressure.



This method is particularly applicable for lower dentures, when the ridge is thin and subject to fracture in closing down the flask as ordinarily done; also where it is desirable to insert a metal bar for strengthening purposes; for partial plates, and especially those having clasp attachments, which easily become displaced in closing the flask, for regulating appliances and interdental splints. (See ITEMS OF INTEREST, Vol. XXIII, No. 9, page 659.)

For repairing cases the same method can be carried out and shortens the time usually required for such work.

After having seen plates constructed in the above manner that have been in service for more than ten years we can see no difference in fit and wearing qualities from those dentures made under pressure.

We think the fine rugae and under-cuts of a model suffer *much less* interference than when a flask is closed with pressure; therefore a better adaptation of the finished appliance is obtained.

The illustration shows a full upper and lower denture set directly into vulcanizable gutta-percha ready to be vulcanized.

Repairing of Broken Crowns Without Removing the Pin.

By J. E. TAFT, D.D.S., New Haven, Ct.

Having had occasion to replace a broken pivot tooth or Logan, an idea came to me, or I recalled seeing an explanation in some magazine, of a method to replace the crown without taking out the pin.

Every one knows the dangers and the care needed to successfully drill the cement away from a broken crown pin so it can be taken out whole.

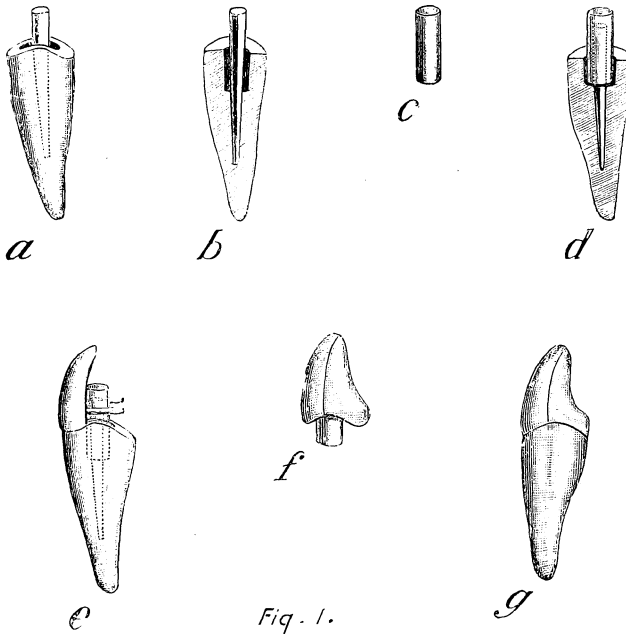


Fig. 1.

First, clean away all remnants of porcelain. With a fine round burr drill away the cement around the pin to a depth of one-eighth of an inch, or more if you want more strength. With a piece of thirty gauge platinum make a roll to fit the pin in root and in length from the bottom of space made by taking out the cement to a little above the top of the pin. Burnish the top of the tube over the pin. It does not need soldering if the tube has no great holes to let in the porcelain body.

This is placed in position and platinum foil placed over it and burnished to the end of the root as in making an ordinary pivot crown. A facing is ground to place with pins clasped around the tube pin; wax

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is applied to the back and all taken off, invested and baked as usual. The foil is stripped from the bottom, leaving a perfect fitting crown.

As to strength; it has a double holding power, that of a pin and will stay where any pivot tooth will. If preferred, the facing can be backed, and attached to the tube and platinum foil with gold solder.

In the illustrations, A represents a root of a tooth with pin of broken Logan crown still in position. B is a cross section showing the cement drilled away. This might also be done with a trephine. C, Platinum tube made to fit over the Logan pin. D. Cross section showing the tube in place over the pin. E. The same with facing crown to fit. Platinum foil being burnished over the end of the root. F. The complete crown; the dotted line showing the pin facing and tube. G, the crown in place of root.

The Manipulation of Metallic Shell Inlays in Vital and Pulpless Teeth.

By T. C. TRIGGER, D.D.S., St. Thomas, Ontario.

The preparations used in the filling of teeth as well as the methods employed for their introduction in dental surgery are very varied. It should be the aim of every dentist to select such material as may be best suited for each case presented to him, rendering to the patient the most beneficial results.

Professor Miller in his book on "Conservative Dentistry" qualifies what an ideal filling should possess; but modern dentistry has failed to accomplish that zenith of perfection, which I fear greatly, is a dream, only, of a scientific and artistic mind. All would rejoice in the fulfillment of such an accomplishment, but present appearances indicate that we have been drifting from the esthetic, using materials chiefly for the greatest utility, namely restoring the functions of mastication.

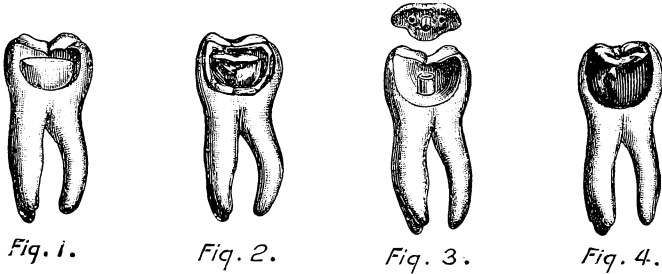
The restoration of lost portions of teeth by means of inlays is as old as the art of dentistry itself, but as new adaptations of old processes are frequently appearing, I need make no apology in discussing the subject as it has been presented to me in a practical way.

Gold inlays have been frequently used in very large cavities of the bicuspid and molars, the walls of which were too frail to support ordinary gold fillings, although they are applicable to almost any cavity, except very shallow ones which will not permit of sufficient anchorage.

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In preparing a cavity for an inlay, there are several requisites: 1. The cavity edges should be thoroughly prepared. 2. The cavity must possess such depth as will admit of good anchorage. 3. The matrix must be easily adapted to the margins of the cavity. 4. Thorough access must be had for its insertion. 5. There must be good retention.

In commencing the operation for inlay work, first cleanse the cavity of all decay, then proceed to trim the edges. In cutting the margins remove any overhanging portions, thereby making a uniform line throughout. Angles must be cut away and converted into curves; and straight lines must not terminate too abruptly in short curvatures. Cut the edges straight and avoid beveling.



The Core.

After the edges have been thoroughly prepared construct a core for the adaptation of the matrix. Take cement or compound and insert it into the base of the cavity, filling it up nearly to the margin and across the whole floor of the cavity. By doing this it will prevent the unnecessary extension of the matrix to the base of the cavity, and at the same time minimize the quantity of gold used for the contouring.

Fig. 1 shows the core in position complete for the swedging of the matrix. In order to obtain an exact impression of the cavity so prepared, take a small piece of impression compound and force it into position; trim to the edge of the cavity and after it cools sufficiently, gently remove. Then from this run a cast to obtain a die and counter-die.

The Matrix.

Pure gold is used for the matrix, and this can be had from supply houses in sheet form. But as this plate is too thick it should be passed through the mill, until the required thinness is obtained. Old gold fillings melted and rolled will answer. Cut a piece of gold somewhat larger than the die, place it in position, apply the counter-die and swage.

After having done this approximately shape the matrix, when it is ready to be further swaged, in the already prepared cavity. To obtain this end, it is compressed in position by various shaped rubbers, consist-

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ing of rings, cones, blocks and points which can be forced when required by blunt instruments, or they can each be attached to the end of points specially constructed to retain them. Dr. Walter M. Bruck in his paper on "The Filling of Teeth with Porcelain," published in the *ITEMS OF INTEREST*, gives an illustration of instruments mounted for this purpose.

Many times without making a die, the matrix can be pressed and burnished in the cavity as described. Fig. 2 represents the matrix accurately in position and edges trimmed. It is advisable in large compound cavities in molars, involving the buccal and morsal surfaces, to make the matrix in two pieces. By doing this it will prevent the buckling of the gold, and thus it is easier to correctly manipulate it in its adaptation to the cavity. When one has satisfied himself that the matrix is accurately adapted, gently remove by teasing it out of the cavity with a fine pointed instrument; then it is taken to the laboratory for further completion.

Take a stick of compound, soften one end, and
Contouring the Inlay. then press gently into the external surface of the matrix. Care must be observed in doing this, as any undue pressure may change the form of the matrix.

The matrix being imbedded in the compound, drill holes for the insertion of pins. The pins should have well formed heads, and their length must be determined by the depth of the cavity. In vital teeth where the cavities are of limited depth insufficient for any extended attachment, countersunk holes should be used. To obtain this end, drill the number of holes desirable and insert points, made from lead from a lead-pencil. Penetrate them beyond the matrix, and after the filling in process they are removed, leaving holes so that the retentive material employed will insinuate itself in the openings thus left in the inlay.

At this stage, if the operator found it necessary
Variation of Method he could vary his manipulation by any feasible method
for Retention. to further increase the retention of the inlay, such as by using both pins and countersunk depressions at the same time, or by using a small tube sufficiently long to obtain good anchorage at the base of the cavity and extending as high as the surface of the core. To retain this in position it would be well to solder at the lower end a small plate of metal, as will best suit the extent of the cavity. This tube attachment is cemented permanently in an upright position so that the wire anchorage, which is attached to the matrix, will accurately pass within the already cemented post which is in the core. The hollow post which is fastened in the tooth should extend slightly beyond the core, so that when in the act of compressing the matrix over it, it will leave a slight indention which will indicate where to penetrate for the anchor pin. It should fit into the hollow post accurately. (Fig. 3.)





Finally insert the matrix and all attachments in a mixture of plaster and sand to hold them in place and now it is ready for the filling in process. Twenty-two karat gold should be used for soldering all the work throughout as when completed it will give a decided rich appearance.

To cement the inlay in position select the very best and finest cement obtainable. After giving the cement sufficient time to set, the inlay may be trimmed, polished and burnished. (Fig. 4.)

It may be stated here that pure gold has the remarkable characteristic that causes cement to adhere to it in a most tenacious manner.

Swaging Gold Dummies in Vulcanite Flasks Between Porcelain and Plaster.

By STEWART J. SPENCE, D.D.S., Chattanooga, Tenn.

Where, in bridgework, it is desired to use all gold dummies, the shells for the same can be easily, beautifully and perfectly swaged by the aid of the vulcanite flask in the following manner:

Take porcelain teeth (or tooth) and grind and wax to the bridge models in the same way as you would set up teeth for a plate. Then remove these teeth in a body from the model to the lower half of a vulcanite flask which has been filled with plaster. This transference may be correctly accomplished by affixing sealing wax, modeling compound or sticky wax to their buccal (or labial) and occlusal surfaces. After doing this the wax which had been used in setting them up on the model may be picked away, leaving the porcelains ready to be transferred to the plaster. Imbed them, pins downward in the plaster, in such a way that the buccal cusps will point directly upwards when the modeling compound is removed. This leaves exposed above the plaster the buccal and occlusal surfaces and, at each end, a portion of the approximal surface. If by chance there is less surface left exposed than it is desired shall be reproduced in gold, it is easy to trim away a little of the plaster, so leaving "above board" as much porcelain as is needed, and indeed, it is better to leave exposed a little in excess, in order to obtain some edge of gold to dress down, so as to make a nice finish. Especially is this true at the buccal cervix of the porcelain tooth, where the neck may be advantageously extended by carving the plaster to a slight depth, say, a twelfth of

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an inch. The upper section of the flask is now placed on the lower and filled with plaster. When this latter has set, the flask is opened, and the sharp edges of the plaster counter-die impression of the porcelain tooth are nicely rounded, and then swaging is proceeded with much in the usual manner, except that the dies are brought together by screwing instead of hammering.

The slow movement of the screw is much less likely to tear the metal than is the sudden blow of the hammer. Indeed with but little annealing 28 gauge of 22 k. gold can quickly be brought to conform to the exposed porcelain surfaces. The result is a beautiful piece of work, shaped like teeth, with the occlusal surfaces correct in articulation because formed on dies which had been ground to proper occlusion and the whole thoroughly hygienic, because having no interdental spaces. Indeed, the buccal surfaces receive that form which careful operators are at much pains to give them, in other methods, by flowing solder into them.

If it is desired to make a saddle bridge in connection with these dummies, this is easily done by taking a strip of 24 k. gold and burnishing it to the model, which may be done either before or after swaging the block of gold shells.

I do not know whether this operation could be satisfactorily performed with plaster of paris. I use Spence's plaster, which can be made to set eight times harder than plaster of paris. However, for the lower section of the flask plaster of paris would probably work, and Melotte's metal might be used in a circumscribed portion of the upper section, enough to envelop the teeth, the rest of the upper section being filled with plaster of paris.

"One thing brings on another," and this plan of swaging dummy shells in a flask suggested another—that of similarly swaging aluminum plates, which the writer is now experimenting upon with much promise of success.

Fractured Teeth.

By Dr. FREDERICK T. GABEKA, New York City.

In the December number of *ITEMS OF INTEREST*, Dr. Edmund C. Kells give his method of repairing fractured teeth which differs somewhat from mine.

I have a number of these cases doing good service up to the present





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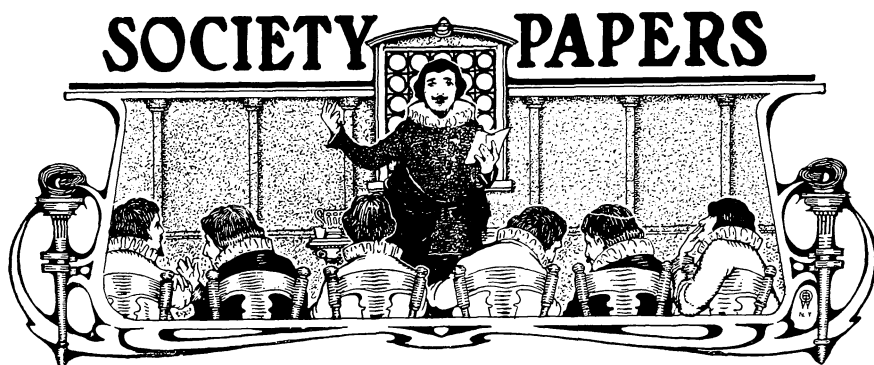
time, of which I will cite three which have been under my observation from time to time.

Case No. 1.—Man age forty years, left upper second bicuspid split in two. I first ligated with floss silk near neck of tooth, then made gold band about one-eighth of an inch wide and drove on tooth, closing fracture completely; then a hole was drilled through tooth from buccal to palatal side, a screw thread cut in same with a How tap and an iridio-platinum How screw put through, screw being first coated as well as hole with soft cement and screwed to place. I now had my tooth perfectly united, proceeded to fill roots and cavity, removed band, shaped tooth and put on a gold crown. This was done in July of 1891 and tooth today is as good as though never fractured.

Case No. 2.—Man age fifty-two years, right lower twelfth year molar split. Treated similarly and crowned. This was done in December, 1900, and the tooth is in perfect condition today.

Case No. 3.—Man, age forty-five years, right upper twelfth year molar split. Same treatment. This tooth was repaired November of 1902 and is doing good service to date. I consider this the strongest way of repairing fractured teeth, where a gold crown is not objectionable.





The Technique of Porcelain Inlay Work with Special Reference to Cavity Preparation and Retention.

By RODRIGUES OTTOLENGUI, M.D.S., New York.

Read before the Maine State Dental Association at Moosehead Lake, July, 1903.

The utilization of porcelain for the filling of teeth has now become something more than a mere fad, and promises to occupy henceforth a prominent place in the daily work of the dentist. Introduced, at first almost purely for cosmetic reasons, its advocates have discovered in it properties which make it pre-eminently the only choice, in many of the most serious cases with which we deal; cases wherein the appearance is of only minimum consequence. I allude specifically to those large cavities which approach the pulp so closely that metallic fillings become a menace to that organ. In the past, the dentist, recognizing the danger of using metals over closely approached pulps, and having no non-conductive filling at hand which would prove permanent, has been compelled to choose between pulp removal, and temporary work, the hope in the latter instance being that Nature might relieve the difficulties of the problem by means of secondary dentine. This is a hope that has often been blasted, the patient returning with the pulp dead and putrescent conditions, if not alveolar abscess actually present. In such predicaments the inlay workers have turned to porcelain and have found the problem's solution. Porcelain therefore is to be counted not merely as a beautifier, but likewise a saver of teeth—and indeed it is a tooth saver for exactly those teeth that most require salvation.

A great deal has already been written in relation to this topic, and I mean no disparagement to any of the other writers when I say that the great majority of the papers thus far have been but empirical descrip-

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tions of personal experiences, which nevertheless have proved most helpful to those entering the field. Nor is it strange that this should be true, when we remember that in spite of the many serious and scientific attempts which have been made to establish a one best method of filling teeth with gold, there are still quite contrary claims made in relation to cavity preparation in connection with the use of that metal.

I must admit, before others bring the accusation, that this paper like its predecessors from other pens will be largely empyrical records of personal views; moreover, I shall not even commit myself to final adoption of those methods which I shall advocate, though I shall give reasons for my views, while reserving the right to alter my opinions during the next year as I have materially done during the past twelve-month. In relation to cavity preparation it is my purpose to call attention to certain principals which seem to be important, and to ask that what I have to offer be accepted merely as a contribution to the knowledge of the subject and for the consideration of the systematist who will, in the near future I hope, take up the whole subject of preparing cavities for the reception of porcelain and so deal with it as to lift it from the slough of empiricism, into the solid realm of scientific methods.

Principles of Cavity Preparations for Porcelain.

The first consideration in this problem is in connection with two important facts, which of themselves separate the use of porcelain from that of the more usual modes of work. These are, first, the cavity must be of such a shape that the filling may be inserted in it as a single mass; second, an intermediate substance must be used, the matrix, which, however, is discarded when the filling is placed. A third, and important fact, which however is subsidiary to the two already mentioned, is that retention is largely dependent upon a cementing medium. Some may deny that this is of secondary importance; I consider it so only in the study of cavity preparation, because it is used for a similar purpose in the older methods of filling. Or to make myself clearer, the use of cement, while important in connection with the shaping of cavities, has a bearing of less influence than the other factors enumerated.

Taking up the points seriatim, let us study the condition resulting from the fact that the filling of porcelain is inserted as a single mass. This at once precludes the possibility of absolute mechanical retention. It does not, however, render mechanical retention completely impossible. I have elsewhere described a dovetailed form of cavity, which does afford considerable mechanical retention, the filling sliding to place as a cover in a grooved box. This style of cavity is rarely useful, but there are places where it will be found of inestimable value.

The fact that the cavity cannot be made absolutely retentive completely does away with a problem which has long bothered the workers with gold. In the effort to obtain retentive shapes, the earlier operators resorted to grooves and pits which frequently left walls so fragile that the forces used subsequently in malleting the gold into place, or later still during mastication, have resulted in fractures, with either loss of the filling or else recurrence of decay. In this dilemma a solution of the difficulty was sought and the more modern doctrine looks to success with the square seat and the occlusal step, with strong walls and cavity margins, and very slight grooves. This system of cavity preparation is applicable to porcelain work to a degree that would surprise those who have not made the attempt, the main departure being in the absence of undercuts, and the arrangement of the actual cavity margins. Two axioms seem safe for adoption in all cavities where the inserted filling must resist the stress of mastication; the use of a broad and as far as possible square seat, in the incisors and cuspids, and the use of the same form of seat together with the occlusal step in bicuspid and molars.

When I speak of the seat as broad, I mean through the tooth mesiodistally, and by square I mean that the marginal line from buccal to lingual aspect must be as nearly straight as possible, the gingival angles of course being slightly rounded. The seat being thus broad and square, may be made either flat, rounded or grooved. The grooved form, where the tooth is pulpless, thus allowing sufficient tooth bone for forming the groove without weakening the gingival border, will materially assist in attaining retention.

With this principal well comprehended let us
Cavity Margins. take up the preparation of a central incisor in which the pulp is alive, but which contains a cavity requiring the restoration of the full corner. It has been common practice, and has often been advocated, that the margins of such a cavity should be prepared at right angles with the labial and lingual surfaces (Fig. 1: cross-section through central incisor), this being usually effected with fine disks, it being carefully observed that the disk should be so held that the enamel is made absolutely flat without bevel in either direction. I have filled a great many teeth in this manner, but from experience I am now satisfied that it is a grave error, and one which largely accounts for joints not being as satisfactory as they may be. My attention to this was first attracted by the following unpleasant incident.

A patient was sent to me by a brother practitioner in order that I might restore a large corner, broken from an enormous central incisor. I prepared the cavity as was then my custom (Fig. 1), the enamel margins being at right angles to the labial and lingual surfaces, and I made

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and inserted a filling. Six weeks later I saw the case, and was astounded to note that the joint appeared as a fine line drawn with pen and ink. This was due to a staining of the cement with nicotine. It would be reasonable for some to imagine from this statement that the adaptation of the inlay must have been bad, to leave so much cement in the joint that it could be stained with nicotine. *Prior to setting the inlay*, however, when merely pressed to place in the tooth, the joint appeared invisible and the adaptation perfect. It was set with a thin cement, force being applied continuously for fifteen minutes until the cement had hardened. I have concluded, therefore, in my own analysis of the case, that the fault was not in the inlay, but in the form of the cavity, and to make my point clear in this connection I must take up the second factor, the influence which the matrix must have upon cavity preparation.



Fig. 1.

Influence of the Matrix.

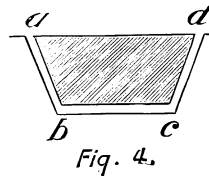
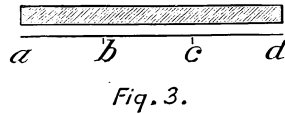
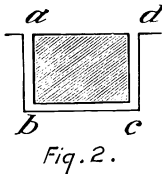
In the discussions as to whether gold or platinum should be used much stress has been laid upon the alleged fact that gold could be used *thinner* than platinum. In my opinion it is not the *thickness* of platinum which renders it less useful than gold, for *few inlays are set with a stratum of cement which is as thin as the matrix*. Nevertheless it is possible to so arrange a cavity that, while at all other parts the cementing medium surrounding the inlay may occupy at least as much, or even more space than did the matrix, along the margins the joint may be made so close that the space will be considerably less than the thickness of the matrix material, and in some cases may even be brought into actual contact.*

You will please imagine a cavity having the shape of a perfect cube, that is to say with sides actually parallel with one another and rising at right angles with the bottom (Fig. 2). Suppose this box-shaped cavity to be evenly lined with a layer of either gold or platinum, and this lining removed without alteration of shape, to be used as a matrix. Then suppose that the porcelain is accurately fused, producing a perfect cube. If we strip the matrix from this cube of porcelain and drop the same accurately into the cavity, examination will show that it can be brought into

*The underlying principle now to be discussed was communicated to me by Dr. J. E. Nyman in conversation.—R. O.

actual contact with the bottom or floor, but that space will exist at all four sides. Lateral movement will bring the block into contact with two other sides in addition to the floor (the space at the opposite sides of course being doubled), but no manipulation will produce contact at all four sides. Thus the margin must of necessity be open as wide as the thickness of the matrix throughout one-half of the margin at least.

This shows that in cavities surrounded by tooth substance, as in approximal cavities in incisors which do not reach the incisal angle, as well as in labial cavities, the preparation of margins at right angles with the adjacent surfaces is erroneous. We have seen that the cube dropped into the box comes into actual contact with the bottom. It follows that if the sides are flattened out to the same plane (Fig. 3), a mass of porcelain fused on a piece of metal which had been adapted to such a surface



would come into contact throughout. Thus it follows that the nearer the sides of a cavity approach the same plane as the floor, the more accurate will be the adaptation of the porcelain to the cavity surface. But this flattening of the cavity, leaves us more and more dependent upon the cement for retention, since the flatter the surface the less mechanical source of retention we will have. There is little doubt that the first form, the cubical cavity with sides at right angles to the floor will afford the greatest opportunity for retention; the second, where the cavity is entirely flat, offers the least retentive quality even though it gives us the closest joint.

If we form the cavity, with the walls inclined at an angle of forty-five degrees (Fig. 4), we make a compromise. The retention is worse than in the cubical form and better than in the flat; but conversely, the joint is better than in the right angled cavity, though worse than in the flat. If an inlay for such a cavity is dropped into place till in contact with the bottom (b to c), the space left at the margins (a and d) will be just one-half the thickness of the matrix used. It follows, therefore, that if the bottom of the inlay be ground off to the extent of half the thickness of the matrix, the whole inlay may be brought into contact with the cavity at all parts.

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Influence of the Cement.

For a moment it would seem that this is the best result obtainable; but further analysis shows that it is not. And here we come to the influence upon cavity preparation which the cement will have. We have shown that in the first cavity, the cube-shaped, the inlay can be brought into contact with the floor (b to c); but this is only true in the absence of an interposing substance. If cement be first placed in the cavity, the cubical block of porcelain can no longer with reasonable force be pressed against the bottom, because the lateral walls rising at right angles (angles a b c and d c b) will imprison the cement between the inlay and the cavity bottom and prevent its displacement. Thus this form of cavity, though having the greatest powers of retention, will nevertheless produce an inlay surrounded by the maximum quantity of cement. In the flat cavity, the greatest quantity of cement can be displaced as exit is afforded at all sides, so that the thinnest residuum of cement would remain at the joint (a and d) and between the inlay and the cavity sur-

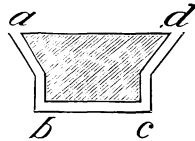


Fig. 5.

face. In the third form, where the walls are made flaring at an obtuse angle, we would be able to displace a greater portion of the cement because of the lessened resistance of the walls, than in the case of the cubical form, and we would get a much closer joint, but we would have at the same time less retentive strength.

Can we do even better than this? I have said that analysis shows that we can. We may do this by inclining the wall only to one-half the depth of the cavity (Fig. 5). Thus the lower part of the inlay would fit as did the cube, while the upper part, with the walls now flaring off, would give us opportunity for a closer joint along the margins. The resulting inlay would have a form diagrammatically similar to the head and part of the shank of a screw. Theoretically this would not obtain so good a joint as where the flare of the walls reached fully to the bottom, because the lower right angles would still imprison the cement and prevent forcing the inlay tightly to place. Practically, however, this is overcome by grinding from the extreme bottom of the inlay so that contact along the flare of the walls could be reached before the actual bottom of the cavity were touched. In practice also we would not have actual angles.

These, it must be understood, are *underlying physical principles*.

Their application to practical work must be modified to meet the characteristics of the material with which we deal. For example, however desirable it might be theoretically to flare the walls to an inclination of forty-five degrees, in many instances this would produce too weak an edge of porcelain. Judgment, therefore, must be used, and the departure from the right angle formation must depend upon the masticatory stress which is to be met.

**Restoring an
Incisal Corner.**

Applying these principles to the practical management of the cavity under consideration, the incisive corner of a central incisor we find that by examining a diagrammatic cross section of such a cavity prepared with the margins flat, and at right angles with the labial and lingual surfaces (Fig. 1), we meet the same obstacles in setting the inlay as was discussed in connection with the cubical form. (Fig. 2.) The cement is not easily displaced because of the angles, and the resistance of the flat surfaces. Thus we have a joint with the maximum of cement interposed. If after this mode of preparation we stone away the angle



Fig. 6.

of enamel nearest to the dentine, that is to say flare the margins from the dentinal surface out towards the labial and lingual surfaces (Fig. 6) we approach the screw-head formation (Fig. 4), which, we have seen, gives us the best attainable resistance coupled with the closest joint. Indeed it is possible with judicious grinding of the inlay, substance being removed from all parts except the absolute margin, to produce an inlay which will be in contact along the margins, while sufficient cement is imprisoned to hold the inlay in place. In dismissing this phase of the subject I will say that I have during the past winter been practically utilizing these principles with the result of vastly improving my margins, *after setting*. Of course any well made inlay will show a beautiful margin prior to the interposition of cement.

A second point to which I wish to call attention may be discussed in connection with this same incisive corner restoration. Consider now, if you please, the point of contact between inlay and tooth at the extreme incisive edge. It is customary to prepare this place also at right angles to the labial and lingual surfaces (Fig. 7) with the enamel left flat from dentine to the outer surface. Again we find the obstacles to a close joint, because of the difficulty of forcing the cement from between the two flat surfaces, that on the tooth and the corresponding place on the inlay.

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What is the result? Within a year the patient discovers a slight crevice at this location due to the washing out of the excess of cement. If permitted to remain some fine substance (as in biting a thread) may enter this crevice (Fig. 7 a) producing a disaster. Or it may be necessary from time to time to use a disk, which slowly but surely shortens the tooth. Where the labial and lingual plates are left on the same plane, it is best to use small stones and bevel off this point from the outer edge of enamel inwardly (Fig. 8). This, however, is not the best course since too much beveling would weaken the enamel (Fig. 8) so that it might be chipped under the stress of mastication. The remedy here brings us at the same time to a discussion of the best formation for retention of these incisive corners.

The cavity preparation which does not afford a broad seat gives us a shallow cavity, in which case almost our whole reliance must be upon the retentive strength of cement, which will be all too little. With a broad seat the stress of mastication is transmitted through the long axis of the inlay to this solid base against which the inlay rests, and thus the broader

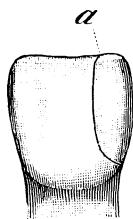


Fig. 7.

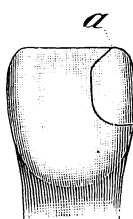


Fig. 8.

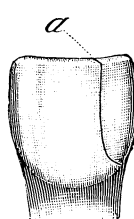


Fig. 9.

the base the less liable the disturbance of the inlay. In broadening this seat of course there is a limit to extension pulpally. Considerable extension, however, may be made at the linguo-gingival angle, the lingual enamel being freely removed at this point until a firm seating is had. The lingual enamel may then be removed as far as permissible from this point towards the incisive edge, so that when we reach the latter situation a line connecting the labial and lingual plates of enamel would cross the incisive edge diagonally (Fig. 9 a) rather than at right angles, as heretofore advised. In a cavity thus fashioned, the lingual surface of the inlay would be much wider than the labial; thus in addition to the advantage of the broad seat we have the labial plate of the tooth resisting the pressure brought against the lingual surface of the inlay which now resists the stress because of the extension of the cavity on that side. There will be a closer joint along the incisive edge because of the slant at that surface, and with less reason for the cement to wash out, the open joint is less

noticeable to the tongue even should it occur, which is improbable. Likewise it is not likely that thread or other substances could do damage.

In the case of devitalized teeth, the extension at the lingual aspect would sometimes bring the inlay quite to the median line of the tooth, the extension, however, being greater towards the gum than at the incisive edge. In this form of cavity a deep groove may be cut to serve as the seat; this adds greatly to the retentive strength. If Crescent gold be used, matrices can be made for such cavities so that a very great depth of the inlay rests within the cavity proper.

The Value of Pure Science to the Dental Profession.

By GEORGE A. BATES, D.D.S.,

Professor of Dental Histology in the Tufts College Dental School.

Read before the Boston and Tufts Dental Alumni Association, at its annual meeting, held June 16, 1903.

In presenting this paper to you, I wish to bring to your attention a few facts relative to some recent aspects of the embryology and histology of the tooth, together with some suggestions for future problems surrounding these important subjects which are awaiting investigation.

I desire also to call your particular attention to a need there is for working along these lines and to emphasize some aspects of the much mooted question of the relation of the dental profession to the parent profession of medicine.

The studies of embryology and histology form the major subject, while the latter part of the paper is presented only as a series of suggestions, the basis of which have grown out of many years of observation.

The study of the embryology of enamel has engaged the attention of the most eminent biologists of the nineteenth century, a list of whose names would be a long and imposing one.

The great difficulty attending the study of this complex subject and the want of proper and accurate instrumentation very early developed extensive discussion. Modern methods have, in some measure, decided many of the questions at issue, and yet, in the more or less remote details, there are still many questions awaiting answer.

The curious and ingenious account given by Schwann of the formation of enamel illustrates, in a way, the work of the very early observers. This account was written at the very dawn of cell study, when the whole subject of histological science was just taking shape. At this time all

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work was done under the disadvantages of crude instruments and with absolutely no technical assistance.

When we read the names of Purkinjé, Raschkow, Frankel, Joh. Müller, Retzius, and Von Linderer, and consider the work which they did with absolutely no precedents, with no knowledge of the cell as even Schleiden and Schwann knew it, we are surprised to find how familiar many of their statements sound to us as we read their classic writings.

It is interesting to see how near these early observers came to a true interpretation of the conditions as we know them; and yet for the want of the knowledge which the researches of the last two decades have produced they could not comprehend the exact meaning of their own observations. No precedent had been established. No body of literature had been published. They themselves were the pioneers and their work was the beginning, the very earliest chapter in the scientific story which was destined to enlist the minds and efforts of an army of workers, many of whom were not yet born.

Perhaps no branch of embryology has suffered more during the years since these men worked from the confusion incident upon unscientific work. It is difficult to understand how many of the conclusions were reached from the premises. Anything passed for science that bore its name. The most and best work upon the subject was done by men outside the dental profession. The dentist has been slow to recognize the value of pure science to him and to his professional standing.

Not long since I listened to a paper by Dr. R. R. Andrews, given before this Association, on the subject of "Calcoglobulin in its relation to the health and disease of the teeth." I was very much inter-

ested in his masterly presentation of the subject and also in the photographs which he presented in the series of lantern pictures that illustrate his lecture.

I am the more interested in the work of Dr. Andrews because he has stood so many years as a distinguished representative of the class of men who have given their time and used their fine talent for the uplifting and dignifying of the profession of dentistry. I am sure the profession at large owes Dr. Andrews a great debt of gratitude, and I am grateful for this opportunity to express my part of it. We, as an Association, appreciate the honor which comes to us by this privilege of numbering him among our membership.

Dr. Andrews, along with Dr. Leon Williams, of London, and Dr. Carl Röse, of Germany, are the representatives of the growing body of men, who are devoting their thought to lines of pure science entirely in the interest of dentistry, and who are making it possible for the modern

dentist to base his point of view upon the facts of responsible scientific research. From the foregoing it will be gathered that our branch of science is at once old and new. It is old in the sense that K  lliker, Huxley, Tomes, the elder, and others of their time made contribution to it, and new from the fact that it was only about fifteen years ago that R  se gave to the world the true story of the development of the tooth.

It will interest you, perhaps, to know that **Origin of the Tooth.** previous to that time the origin of the first permanent molar was not known. It was stated by Legros and Magitot that the enamel organs of the permanent teeth were developed from the necks of the enamel organs of the deciduous teeth. This seemed to hold good for all the second dental equipment until the second deciduous molar was reached, which was said to produce the second bicuspid. The first permanent molar had no predecessor and so could not originate like the others from a preceding deciduous tooth. It was, therefore, said to take its origin, like the milk teeth, from the epithelial surface of the jaw. Dr. R  se, by the discovery of the *zahnleiste*, or tooth-band, settled this question and demonstrated that all the teeth, whether deciduous or permanent, originate from this fruitful source.

The development of the tooth is perhaps the most remarkable exhibition of modification for use which is presented anywhere in the body. Here are two sets of cells, one produced from epithelium and one from connective tissue, in close apposition, each concerned in the formation of a secondary substance of kindred nature and yet differing materially in chemical composition.

The principal factors in enamel development are the so-called ameloblastic cells. From these cells is shed out upon the already formed dentine the material of which the enamel is to be composed. On one end of these elongated enamel forming cells lies the formed enamel; and on the other the elements of the enamel organs, the intermediate layer, or *stratum intermedium*, and the stellate reticulum, which are supposed to furnish the material for elaboration into enamel to the ameloblasts. Between the *stratum intermedium* and the ameloblast, Dr. Williams has demonstrated a fibrous membrane. Dr. Andrews, in his valuable contribution read before the Dental Congress at the World's Fair, demonstrated the existence of certain fibres which pass from the ameloblastic layer into this membrane. Dr. Williams has also shown that there are loops of arterial capillaries which, through the *stratum intermedium*, reach the ameloblasts, or at least the membrane which lies between these layers.

I wish to call attention to the fact that this arrangement is suggestive of glandular structure. Also that this offers a suggestion of the possible nature and function of Dr. Williams's membrane, viz.: that it acts in

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the capacity of lymph-spaces for conveying the lymph from the arterial capillaries, as well as the material held in store by the stellate reticulum and *stratum intermedium*, to the ameloblasts for the purpose of elaboration.

There is no instance in the body where this function is carried on save by the connective tissue, and I wish to express my belief that this membrane is of connective-tissue origin, at least, if not actually composed of connective tissue. I hope to demonstrate this, one way or the other, at some future time.

Enamel. Enamel is formed by tissue which is composed of specific cells modified from embryonic epithelium for the direct purpose of elaborating the material out of which the enamel is developed. By no possibility can enamel be formed after this specific tissue ceases to exist. It ceases to exist when the tooth is erupted, therefore new enamel cannot be formed upon erupted teeth. Enamel has no tubuli like dentine and no communication with the blood supply, and therefore no power of regeneration. Phosphatic foods are thus ineffective in restoring defective enamel.

Caries. Imperfectly formed enamel is only a predisposing cause of caries. Teeth of marsupials have tubular enamel, and all the lower animals have less calcific material in the teeth than has man, and yet there is no caries.

There is no specific form of micro-organism yet discovered for dental caries. Any form which will split the molecule of sugar into alcohol and carbon dioxide will institute a condition of incipient caries by removing the calcium salts from the enamel and thus opening the way for the ingress of the organisms into the tooth structure. Sugar by forced oxidation is converted into certain forms which are transitional between sugar and CO_2 . These are further reduced by bacterial action to form lactic acid.

Many of these points are not new, but I venture to present them in this fragmentary way to refresh your memories and to suggest their very great importance to you as dentists. Since writing the above the very instructive papers of Dr. Miller, of Germany, published in the *Dental Cosmos*, have come to hand, and also the able contribution by Dr. Samuel H. Hopkins, of our own school, both of which present for consideration the subject of the action of micro-organisms in the process of tooth destruction by the agency of caries.

Dr. Miller is a pioneer in this field of investigation, along with Dr. Black, of our own country. The work of Dr. Hopkins, in our own midst, is of a character which is doing much to place the standard of our school on a very high plane.

Odontoblasts. I wish now to say a word concerning the other set of cells spoken of at the beginning. These are

the odontoblastic cells. They are formed from the connective-tissue cells of the dentinal papilla. This papilla is eventually to become the dental pulp. In the adult dental pulp these cells form a membrane which covers the organ on its external surface, and a part of these cells send processes through the dentinal tubules in the form of the dentinal fibrils. The cell also sends processes backward into the substance of the pulp.

The odontoblastic cell is an example of the protean nature of the connective-tissue cell. This latter cell is the one which, whenever or wherever the need arises, may be transformed into almost any element of the body. For example, it may become a fat cell, it may be transformed into a bone-making cell, or osteoblast, or into a plasma cell. In certain pathological conditions into a cell so nearly resembling the epithelial cell as to be called an epithelioid cell. In the embryo it is made into blood and blood-vessels. It is closely related to the lymphatic system.

The odontoblastic cell is concerned in the developing tooth, with the formation of dentine, and in adult life it probably serves to keep this structure in its integrity. The sensitiveness of dentine is in some way involved with it and its process, the dentinal fibril; just what is not known. This offers a problem for investigation which is eminently practical, for the discovery of the cause of sensitive dentin will be a boon, indeed, to the dentist.

Referring for a moment to the foregoing statement concerning the connective-tissue cell and its relation to the lymphatics, I wish to call attention to a statement made by one of the recent writers on dental subjects, "that there are no lymphatics in the tooth pulp." I wish to say I think this statement grows out of a want of adequate knowledge of the lymphatic system. Lymphatic radicals are formed by the lining of connective-tissue lymph spaces by endothelial plates. The pulp is composed of connective tissue, and there are many such spaces in its substance. Wherever there are capillary arteries there must be extrusion of lymph into the surrounding connective tissue; and this extruded lymph can be disposed of only in one way, viz.: by the lymphatic radicals which therefore must exist in the pulp. It is not necessary to have formed lymphatic vessels in a tissue in order to have lymphatics. Here is another field for investigation.

After years of experience, both as a teacher in
Value of Science to a dental school and as a practitioner, I am inclined to
the Practical Dentist. think that too little attention is given to the so-called theoretical side of dental education. I am also of the opinion that many practicing dentists do not quite appreciate the inti-



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mate relation which, in the growing knowledge that marks the times, has become established between the so-called practical and the scientific or theoretical aspects of a dentist's equipment. This is more or less inevitable, since the busy dentist is called upon to devote himself so constantly to the mechanical side of his profession.

It is undoubtedly true that the estimate put upon the dental practitioner is in great part formed because of his skill as a mechanical operator. The truly wonderful results which have been and are being achieved in this field of effort are, in themselves, proof enough of the very great importance of this side of dentistry. While this is true, it is equally true that the purely theoretical elements which enter into the training of the dental practitioner fill an immensely important place.

In these days when everything in the nature of material entering into the finished product of the dentist's work is furnished ready made to his hand; when carefully devised, accurately shaped and constructed instruments are at the operator's disposal, it is easy to become unmindful of the fact that somebody, sometime, has given much time and attention to matters of theory in order that the workman may have at his hand these things so necessary for the proper accomplishment of his work.

It is easy to forget that the great fundamental sciences, such as anatomy, physiology, chemistry and the like underlie the whole subject of the adaptation of these materials to the requirements of practice. It is the self-sacrificing zeal of men who have devoted their lives and energy to the work which has rescued dentistry from the barber's shop, where it had its birth, and made the modern profession a possibility.

I am not unmindful of the fact that the study of the great scientific subjects above mentioned is to a great extent the work of the specialist, and that it is not essential for the practitioner to become a specialist in his knowledge of them. I am, however, confident that the field of dental practice might be materially widened if more attention were given to those parts of the great fundamental branches which pertain directly to the mouth and teeth.

I believe the time is coming when the dentist will become the stomatologist; when every lesion liable to occur in the mouth will become the legitimate field of the doctor of dental medicine. In the present state of dental education it is very exceptional to find a man, in general practice, possessed of the requisite ability to handle emergencies outside such as occur in and immediately about the teeth, which present themselves in every dentist's experience with more or less frequency.

I am sure it is unnecessary to say that any condition which involves constitutional disturbances calls for a more or less profound knowledge in the fundamentals on the part of one who attends in the capacity of

physician. Here a knowledge of pathology, materia medica and therapeutics is called for in a manner not at all necessary to the ordinary dental operation. It seems to me that the doctor of dental medicine should be able to meet all conditions, whether such as immediately concern the teeth or other parts of the oral cavity.

The need for more knowledge in fundamental sciences does not, I am convinced, apply alone to such as may extend their practice to cases outside the direct treatment of the teeth. It is just as essential to the dentist who devotes himself to the so-called practical operations. How often one hears the statement that "it is a dentist's business to fill teeth," with the implied meaning that his responsibilities do and should end here. I will venture to say that there are people practicing dentistry today who do not know and do not care to know the structure of a tooth; who never saw a microscopical section of a tooth, and who know the parts of the dental organs only by name. I think I ask a pertinent question when I say, "Is a man over-educated when he does know these things, and does he not represent his profession with greater dignity and usefulness with than without such knowledge?"

It may be in the end that there will come a tendency to establish a class of specialists in dentistry who shall be educated in the particular branches such as involve the necessity for a training in the foundation principles so necessary for an all-round dental education. This would leave the so-called practical side of the work to those whose tastes and capabilities seem to lead them naturally in that direction.

Such a course would certainly broaden the field of dental practice and, in some ways, increase its usefulness. I have sometimes thought that the dental schools might profitably confer two degrees—the Doctor of Dental Medicine and the Bachelor of Dental Mechanics. This would give the two classes of students opportunity for more specific training in the two lines of education.

There are people constantly presenting themselves for matriculation at the dental schools who display no taste nor capacity for purely scientific studies. These people are good mechanics, and many of them make fine operators. They will become good dentists in the ordinary meaning of the term and useful members of the profession. In the broadest sense, however, they can never become well-educated doctors of dental medicine. To give them the title is to misrepresent them and belittle the profession into which they seek admission.

**Dentistry as a
Specialty of Medicine.**

There has been much said and written concerning dentistry as a specialty in medicine. It has been compared to ophthalmology and other medical specialties. It must not be forgotten that all these





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branches of the great medical profession require a training in general medicine and a more or less extensive practice before they are possible as specialties. If dentistry is to claim a place as a branch of the profession of medicine, should it not enter as other departments do? It needs no word from me to demonstrate that such a course would call for extensive training in the collateral scientific branches of study, without which the doctor of medicine, as such, could have no existence.

If the profession of dentistry is to be considered solely from the material or commercial standpoint, then the way to attain it should be by the shortest cut, so that it may begin as soon as possible to answer its legitimate requirements. But let it be called by its right name. Do not try to dignify a mere mechanical art by a professional title. On the other hand, if the dentist is to hold his place, as I most sincerely believe he should, in the rank of the learned professions, then the higher motive of service to humanity should stimulate him to the attainment of a broad, well-grounded culture. The purpose of his professional achievement should be the discovery of the underlying causes of those conditions, for the remedy and prevention of which he is called upon to exercise his knowledge and skill. When this attitude towards required education is assumed, its claim to professional dignity becomes legitimate.

I am sure these sentiments find ready response in the minds of those who may be classed among the best and most responsible members of the profession. I have been impressed with the truth of this from the fact that many of my former students and others have been of late coming to me for instruction. The earnestness which they have shown in their attempts to acquire more extensive knowledge of fundamental things is, to me, the striking feature in this experience. It grows out of the need, observed by them, as they have looked out upon their field of labor. They have noted the woeful lack in these essential elements of training existing among members of the profession at large, and have felt the requirement in their own experience. The fact that such men are awakening to a realizing sense of these conditions is, I think, a hopeful sign of the times.

Great numbers of people are in these days attempting to crowd their way into the dental profession. The complaint is often heard that dentistry, like many other branches of industry, is becoming crowded. I am sure this is not true. Dentistry in the best sense of the term can never become crowded. There will always be a place for the well-educated man. The public is becoming more enlightened and consequently more discriminating. It is demanding more and higher attainments on the part of those who serve it in any capacity; and dentistry, like all other departments of service, must reach a high standard of excellence if it expects to hold its place. There always have been and always will be men who

naturally gravitate to quackery. It is the half-educated man who is the quack. The well-cultured man does not need to be such, even though his training did not make it impossible for him to stoop to it.

The whole field of dentistry is not covered now, as formerly, by its remedial resources. Prevention has become a most potent factor in the dentist's field of action. With the discoveries of Drs. Miller and Black, the whole aspect of the subject of tooth decay has become changed. Caries is still the formidable foe of the teeth, but the mystery of its cause and action is much better known. New demands have come with increasing knowledge, preventive measures have taken their place in the front rank of the requirements of practice, and the doctor of dental medicine is called upon for a much wider wisdom than was formerly considered essential.

Where the dental practitioner was once paid in great part only for his skill in restoring organs, which had suffered wreck by the destructive action of disease, he is now, in increasing measure, required to equip himself with knowledge profound enough to furnish not only remedies but preventives as well.

The growing aim of medical science is the discovery of the causes of disease and means of prevention. The whole great department of *materia medica* is in danger of supersedence by the growing importance of the new department of bacteriological investigation. Men are getting a deeper insight into nature. The microscope is revealing a whole new world. It is demonstrating more and more clearly that the causes of pathological conditions, which have ever been mysterious, are the results of agencies, to be found among the lowly elements of the kingdoms of life, that man's unaided eye could never have discovered. Step by step scientific investigation is advancing toward a broader outlook. Wider and wider grows the field of effective action, as the horizon of the unknown is pushed back more and more. Every department of knowledge is feeling the push of investigation. Every individual whose motives or interest brings him into touch with the growing wisdom feels the impulse and enthusiasm which seems to fill the air. True science cannot live and breathe in the atmosphere of commercialism and self interest. Men of science are giving themselves and all they have and are for the increase of knowledge and the advancement of the common good. A great, wide, altruistic optimism is the only natural and true environment of science. In it and by its influence only can the highest and best attainments be reached. Our own science is no exception, and this must be its standpoint if we are to realize in our work and its results the lasting benefit to mankind, for which every true lover of science so earnestly yearns.





The Phenomena of High Frequency Currents and their Importance in the Treatment of Disease.

By FREDERICK F. STRONG, M.D., Lecturer on Electro-Therapeutics at Tufts College Medical School.

Read before the Boston and Tufts Dental Alumni Association, October 14, 1903.

In 1891 Nikola Tesla gave to the world the important results of his studies on alternating currents of very high frequency and high potential. He found that in the attempt to produce currents of this nature he obtained certain phenomena of a startling and unique character, which were not exhibited by electric currents at lower voltages and frequencies. He devised an ingenious method of raising the voltage and frequency of these currents, which enabled him to produce them by transforming the currents ordinarily used for electric lighting. His apparatus, however, was cumbrous, requiring a large oil tank for its insulation; and up to a short time ago no successful attempt has been made to produce a practical and efficient apparatus for the generation of high frequency currents for medical and other purposes. I shall not burden you with technical details but I shall try to make clear to you what we mean by high frequency current, as the time is coming when high frequency currents will be used to an enormous degree, not merely in medicine, or to produce the X-ray, or the ultra-violet ray, but for various other important purposes, such as the production of light, heat, power, etc. All purposes which are served by low voltage currents at the present time, will ultimately be fulfilled by currents of high frequency.

An electrical current may be continuous like a
High Frequency stream of water flowing through a pipe, or alternat-
Current Defined. ing, in which case the current consists of impulses
or surges, first in one direction and then in the other.

A number of these alternating impulses in a unit of time gives us what we call the frequency of the current. A high frequency current is one in which the frequency is over ten thousand per second and in which the voltage or pressure is very high. The apparatus which I shall employ this evening gives a current of over one million volts, while the frequency may be varied from one hundred thousand to many millions per second. I have in my laboratory a machine which gives frequencies far exceeding those mentioned and produces luminous flame-like discharges of surpassing brilliancy. Owing to the enormous frequency of these alterna-

tions the result is a force of a vibratory character. Any substance, whether a conductor or non-conductor, solid, liquid or gaseous, through which these currents are passed, vibrates at the same rate, or frequency, as the currents themselves. This is the fundamental principle in the application of high frequency currents to therapeutic purposes; that is, their ability to raise the frequency and amplitude of the vibrations of any substance through which they pass, and to excite vibrations in substances which are not already vibrating. No other force, with which we are familiar, will produce this effect. Vibration from our modern standpoint is at the basis of all the phenomena of the objective universe: life, light, electricity, chemical action, heat, the X-ray, all are forms of vibration.

Light, heat, electricity and the X-ray mean to us widely different things, but if we stop to analyze this difference we find it is one of interpretation. Objectively these effects are simply due to variation in the vibratory frequency. The difference is in our sensory ability to appreciate or interpret these forces. Our eyes allow us to interpret a small range of vibration, to which we give the name, light. Below these vibrations is a small range which appeals to us as heat. Below the heat waves is a great series of ponderous waves, which we call the electro-magnetic waves of Hertz. These are invisible to us but are the waves which are employed in the transmission of intelligence by wireless telegraphy. On the other hand, beyond the range of vibration, which appeals to us as light, we have a number of octaves of invisible waves which we may demonstrate in various ways by transforming them into other forms of vibration. Among these vibrations we have the ultra-violet ray, or photographic ray, the X-ray and the Bequerel ray. The Bequerel ray is a vibration similar to that given off by the recently discovered metal Radium. All of these are vibrations just the same as light with the difference in the frequency of vibration. Raise the vibration of this candle flame to a certain extent—increase the rapidity of movement of the particles, which by their chemical action are causing the phenomenon to which we give the name flame; raise these to a certain degree, and the flame disappears. If, however, we expose a photographic plate before such an invisible flame, a picture would be produced. In other words, the photographic plate is able to record a vibration at a higher rate or frequency than the retina of our eye is able to perceive. The same principle applies to sound; our ears have a very limited range. Insects may have a complete language of sound beyond the range of our perception. We may imagine that in some future existence we may inhabit a body of such a refined and highly evolved nature that we will be able to directly sense all forms of vibration. Then indeed might we listen to the "Music of the Spheres" from the somber diapason of the suns swing-

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ing in their ponderous orbits to the shrill vibration of the oxygen atom, singing his love-song to his two hydrogen-atom wives in their snug home in the water molecule.

Let me repeat: the forces which we call high frequency currents consist of electrical impulses alternating with enormous rapidity. The degree of rapidity is determined by the construction of the apparatus producing them. The fact that I wish to emphasize is that by means of this rapid vibration, which we can transmit to any substance, through which we pass these currents, we can produce all sorts of vibratory phenomena; not only the vibratory phenomena which appeal to us as light or heat, but those which appeal to us as the X-ray, chemical action, etc. The X-ray is usually produced by what we call continuous currents; currents which flow along like a stream of water in a pipe. These currents may be produced either by batteries, the Static Machine, or the Induction Coil. It is impossible to produce X-rays from a continuous current from a battery economically, as the pressure of voltage required is too high.

A current of great pressure and small quantity is necessary, and this current, passed through a tube from which all but one-millionth part of the air has been exhausted, sets this little residuum of air into exceedingly rapid vibrations, and these air particles, bounding back and forth between the little metal electrodes that lead the current into the tube, give rise to what we know as the Cathode rays, and these Cathode rays, impinging on the surrounding ether, give rise to the X-rays. The high-frequency current can be used to produce X-rays as well as the continuous current, but a different form of tube must be used. Those of you who have used the X-ray have probably employed the induction coil, which gives practically a continuous current. The Static Machine also gives a continuous current and is useful for X-ray generation.

The high-frequency current is, then, a *transmitted electrical vibration*. This fact accounts for many peculiar phenomena which these currents exhibit. For instance, they will flow through glass, hard rubber, or any other medium that we commonly consider as a non-conductor. Nothing will absolutely insulate these currents. It is only after exhaustive experiment during the past five years that I have finally devised an apparatus, in which it is impossible for these currents to break down the insulation.

Use of Currents in Treatment of Disease.

The great interest in the use of these currents to the profession of dentistry and medicine lies in the fact that they are susceptible of being used for the production of a number of important effects, both of a therapeutic and a surgical character. My

work has led me to investigate these currents more particularly in the line of their application to the treatment of disease. Briefly speaking, the effect of a high frequency current on the human body differs from that of any force with which we are familiar; it is no more like the effect of an ordinary electric current, Galvanic, Faradic, or Static, than is the effect of the X-ray like light. It may be defined as an intense vitalizing force. The slight increase in stimulation, in vital action, produced by the force and vibration of a faradic coil, or a static machine, cannot be compared with the intense oscillatory force which passes through the nerves and tissues when the high-frequency current is applied to the body, and which gives rise to increased vitality, increased chemical action, etc. This current is not a stimulant; it is a vitalizer: it does not act like a glass of wine, increasing the heart's action for a short time, followed by a reaction, but it absolutely adds energy to the body: energy which is stored up in a potential form and may be used in all the various processes of the body. This can be demonstrated in various ways. Cases that have been under treatment for various diseases in the past demonstrate that the effects are permanent. The most obvious way of demonstrating the wonderful increase in tissue combustion, produced by the high frequency current is in cases of gout, where the urine is loaded with urates. Chemical analysis made before and after the use of the high-frequency currents show a marvelous difference, the urea increasing while the uric acid disappears. For this reason these currents are effective in any condition of the system where the vital forces are depleted. They are almost equal to some of Munyon's preparations in their possibility. The only strange thing is that Munyon has not got hold of them. The high-frequency currents produce definite therapeutic results, which are not due to suggestion and which can be demonstrated over and over again. These effects cannot be produced by any other force with which we are familiar at the present time.

From the standpoint of the work in which this Association is particularly interested, I could think of a number of important uses for high-frequency currents. In the first place a high-frequency current energizes the body of persons anywhere within a radius of eight or ten feet of the apparatus. It was this fact that led me first to investigate the therapeutic possibilities of these currents. The first apparatus of this sort, which I constructed, was made for the purpose of producing X-rays, and I was led to investigate the wonderful gain in vitality which certain patients manifested who were being exposed to the action of the X-ray for diagnostic purposes in the process of taking a skiagraph. This led to an exhaustive series of researches along this line, covering a period of nearly eight years. Some of the results have been most startling. The

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relief of pain in some cases was almost immediate and I was inclined to believe it was due to suggestion, but a number of experiments eliminated this factor to a great degree. Suggestion plays an important part in all forms of medical treatment. As I am a physician I may be allowed to say that a large proportion of the effects attributed to medicine and other therapeutic agents are unquestionably due to suggestion. This fact, however, does not lessen the value of the very real effects, which are produced by medicine and other therapeutic agents.

Dental Possibilities of the Currents.

From a dental standpoint the high-frequency current offers peculiar uses, due to its ability to excite rapid vibrations in the bodies through which it passes. For instance, if we connect the apparatus with a vacuum tube, a tube differing from the X-ray tube, in that it is not exhausted to quite such a high degree, having a pressure of one-thousandth of an atmosphere, it gives a beautiful colored light inside the tube. If we pump out all but one-millionth part of the air we then have a Crookes tube, from which X-rays are produced. The high-frequency currents are, of course, of interest to the dental profession as producers of X-rays in the same way that other currents are. The X-ray has various applications in dentistry, with which you are far more familiar than I am, and upon which I will not dilate. I should like to say this, however, that the X-ray produced from the high-frequency current differs quite materially from that produced by other means. It is just as strong, just as powerful, it has other advantages purely as an X-ray, but it has the added advantage that the patient is getting a wonderful vitalizing effect at the same time that the X-ray is being applied. This gives it a great value over other forms of X-rays. You may have noticed that in the use of the X-ray in cancers, in cases of lupus or of epithelioma the X-ray will cause a breaking down and sloughing of the tissues of the malignant growth, and often the system is so depleted that it is not able to carry away the products of decomposition, and we get a serious sepsis. With the high-frequency current, however, we have a stimulation of the vital forces concentrated in the immediate locality of the tumor, because the high-frequency currents are generated in the body by induction in the immediate vicinity of the Crookes tube; consequently we have this vital action going on at the same time that we have the destructive action of the X-ray.

The ultra-violet ray, or the Finsen ray, which may also be produced by high-frequency current, has been used in Europe more particularly for the treatment of lupus and superficial affections. In this country the ultra-violet ray is used to some extent, but much less frequently than the X-ray.

It acts more like the high-frequency X-ray, in that it has a vitalizing effect on the tissues, in addition to its destructive effect.

The Geisler tube, that is, a vacuum tube having a pressure of one-thousandth of an atmosphere, is, in various forms, an important instrument in the application of high-frequency currents for therapeutic purposes. If we connect a vacuum tube of this character with a high-frequency current and apply it to the body of the patient, we get peculiar local changes in the immediate vicinity of the electrode; the electrode becomes warm and can be made quite hot; an intense chemical action is induced in the immediate vicinity of the electrode, and ozone is produced in the tissues in large quantities. This leads me to suggest the use of this apparatus in dentistry. A small vacuum tube can be made which will illuminate the area of a cavity, and at the same time it will act electrically upon the tooth, causing several results. The heat generated would dry the cavity, ozone would be generated, not merely in the cavity but in the tooth itself, and this would destroy all bacteria and products of decomposition. The combined forces would stimulate the blood in the immediate vicinity and decrease the sensitiveness in the nerve, so that a condition would be brought about by the application of a single instrument, which would under ordinary circumstances require several different processes. As far as I know, this has never been tried.

The anæsthetic effect of high-frequency current is susceptible of many applications, and I should imagine it would be a valuable addition to the armamentarium of the dentist. It is possible to relieve the pain in acute neuralgia in almost every case by a short application of the high-frequency current. Of course this effect is not always permanent, although many cases have been cured by a number of applications.

I will try to show you a few of the effects of these currents upon various exhausted tubes and some of the phenomena produced by passing them through the human body. It is possible to pass these currents through glass, rubber and other substances which we are inclined to regard as non-conductors. The frequency is so high that they will pass through the human body without the slightest sensation, except a slight feeling of exhilaration. Nevertheless incandescent lamps may be lighted through the bodies of two persons connected in circuit with the machine.

As you will see, the apparatus is beautifully compact and convenient, yet elegant in appearance. Externally you observe merely a handsome cabinet, surmounted by three hard rubber pillars, supporting sliding rods, plates and balls of polished brass. The machine can be operated by merely connecting it to a lamp socket by means of a conducting cord

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and plug. The apparatus consists of a transformer, which raises the voltage of the 100 volt current to about thirty thousand volts. This is then passed into a peculiarly constructed condenser, which is carefully tuned to a discharging circuit, containing an inductance in series with a spark or air gap. The condenser discharges across this gap many thousands of times per second, causing an intense alternating electrostatic field in or near the inductance; a suitable secondary or "Tesla coil" is placed inside this inductance and in this coil is induced a current of great frequency and over a million volts. If I set the machine in operation and allow the discharge to pass between two brass balls you will notice that it takes the form of a stream of brilliant light. This is an arc, rather than a spark; in other words, it is continuous and it is an actual flame. It is not caused by the electrical pressure breaking down the air: it is caused by the intense vibration of the air which is carrying the high-frequency currents from one terminal to the other.

I can demonstrate that this is an arc, rather than a spark, by holding a piece of paper in its path and you notice it immediately bursts into flame. If I allow the discharge to pass between two brass plates you notice a different phenomena. Instead of the brilliant arc the discharge splits up into a most beautiful purple spray or rain of infinitely fine threads. This is accompanied by a sound resembling that produced by rain upon a tin roof and results from the bombardment of the many fine streamers flowing between the two plates. If I connect each terminal of the machine with a long piece of tinsel cord, the other end of which is connected with an insulating pillar, for which I will use one of these glass carafes, you will notice that each one of these cords becomes intensely luminous and is surrounded by a zone of purple light over an inch in diameter. Approaching the hand to one of these cords a smart shock is experienced, not from the sense of the electricity but from the extreme heat produced by the discharge which passes. This, of course, would produce blistering if the hands were allowed to remain in contact or in the neighborhood of the conducting wire. If a piece of metal be held in the hand the current may be drawn from the cords without the slightest sensation or danger, and by holding a vacuum tube in my other hand you will notice that it lights up through my body, although I am only connected with one terminal of the machine and the other terminal is, as you see, insulated. If I take a slender vacuum tube, about one-quarter of an inch in diameter and three feet long, you will notice that it lights up like a brilliant streak of light by current transmitted through my body. By waving this around in a circular manner you will notice that you see an effect resembling the spokes of a wheel. Each one of these spokes represents one of the coarser oscillations of the current.

I have here a number of vacuum tubes exhausted to different degrees or pressures. These you see give different colored lights when I hold them in my hand. I will take a number of these tubes and ask those of you on opposite sides of the table to hold them between you. In this way we form a series of intervals, six persons on each side of the table, and between each two persons is one of these vacuum tubes. Connecting the ends of each one of these lines with the terminals of the apparatus all of the tubes light up brilliantly; this line could be extended almost indefinitely and the tubes would still light up. This will give you a little idea of the possibilities of high-frequency currents in the production of artificial illumination.

If I take an incandescent lamp bulb and hold it in one hand, connecting myself by the other hand, to the apparatus, the bulb glows with a blue light, due to the vibration of the residual air particles inside of it. If I connect the other terminal of the lamp to the opposite terminal of the machine the filament becomes incandescent, as in the case of an ordinary current. I now reverse the process, connect the lamp directly to one terminal of the apparatus and approach to the outside of the globe a pointed metal electrode connected with the other terminal. Immediately you see beautiful purple streamers and sparks pass over the surface and through the glass, without puncturing it, causing incandescence in the filament. Here we have a lamp glowing in an incandescent manner, which is really connected by only one terminal. I have here a glass plate upon which fine wires have been glued to form certain words. Upon the back of this plate is pasted a sheet of tinfoil. Connecting this plate with the machine the words become intensely luminous; this is due to the condenser action taking place between the wires on one side of the plate and the tinfoil on the other.

I have here a weak solution of sulphate of quinine in a glass vessel. Below this vessel I place a wire connected with one pole of the apparatus; above the surface of the liquid I hold a pointed metal electrode connected with the other terminal of the apparatus and allow the sparks to play upon the surface of the fluid. These sparks are very brilliant, and, as you may see, are rich in ultra-violet rays. This fact becomes evident on account of the brilliant blue fluorescence, which we see on the surface of the sulphate of quinine solution. This phenomenon of fluorescence is excited by the ultra-violet ray.

I will now connect myself with one pole of the apparatus and you will notice that if any of you take a vacuum tube in one hand and approach me, the tube begins to glow within three feet of my body, showing that although I am not insulated and my body is connected with but one terminal of the machine, nevertheless every particle of my body is

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thrown into intense vibration and these vibrations are transmitted to the surrounding air, forming a vibratory aura around me, in which vacuum tubes will become luminous. Touching my body with a vacuum tube at any point the tube bursts into a brilliant luminescence, showing that every particle of the body is vibrating in an equal degree. It is impossible to use the high-frequency currents locally without affecting the entire body, and producing the valuable vitalizing effect. This effect makes the technique of their application very simple.

It is possible, as has been demonstrated in Tesla's laboratory to obtain a current vibrating at the same degree as the normal vibration of the nerves in the human body. This has been found possible and by employing such a current, we are able to cause complete anæsthesia of the entire body below the upper part of the spine. What this method will do, or what results it will produce in the surgery of the future, it is impossible to say at the present time. I could continue the demonstration of high-frequency phenomena for a long period without exhausting their possibilities, but I have shown you enough to convince you that the high-frequency currents are remarkable forces and that they are destined to play a very important part in the economy of the future, both in commercial lines and in medical and surgical work.

I thank you kindly for your attention and I regret that I have trespassed upon your time to so great an extent.

Treatment of Fractures of the Jaw.

By Dr. D. GENESE, Baltimore, Md.

Read before the New Jersey State Dental Society, July, 1903.

Simple fractures of the mandible without loss or displacement of the teeth have been successfully treated for many years by the interdental splint. But the compound fractures with the loss of teeth have always given trouble whether dental surgeon or general practitioner or both have had charge of the case.

When the patient is seen soon after the accident and before acute inflammation has set in, it is not so difficult to operate in the old time way with silver wire ligatures, bandages and later the interdental splint. But if the patient is at a distance from help, the fracture compound and severe and immense contractions of the muscular tissues have set in, the difficulties of the operator are great, the patient's suffering increased and the hope of a good union of the parts and in their proper position, uncertain and indefinite, the operation itself difficult and prolonged, the forma-

tion of pus and swelling of the soft tissue preventing an adjustment of the fractured parts; and lastly the difficulties under the old system of administering nourishment and properly cleansing the mouth and preventing the decomposed matter entering the stomach are great.

The method which I wish to bring before you was first used in a case of a four-year-old boy who was kicked by a horse, receiving a compound comminuted fracture of the lower jaw. I did not see the boy until eight days after the accident, and he had been in the hospital three days. The case was successful and he was discharged in three weeks, union having taken place without disfigurement; but two years later he was again brought to the hospital with what was supposed to be a tumor. He was operated upon and a displaced tooth was found in the sac.

To convey to you a clear idea of my treatment of this subject, I have, with the consent of your clinical committee, made this paper very short, and purpose to demonstrate the system to you in a practical form. I think you will agree with me that it is simple, quick and devoid of that pain to patient so much dreaded in ligating the fractured parts of the mouth. It has the advantage of being quickly adjusted and leaves the operator free handed for cleansing, ease of administering nourishment, and lastly gives the surgeon a clear view of the wounded parts at all times, with the possibility of readjusting the apparatus without difficulty.

I have taken advantage of soft metals and a new way of mixing plaster. For the internal splint, I take a number of silver strips and coat them with tin. Each one can be bent to form separately, and when laid upon each other and heated by an alcohol lamp or bunsen to the fusing point of tin and pressed together, they form a solid bar. This can be still further strengthened by a steel wire, also tin coated and soldered in the same way, making together a very rigid frame that will support a great strain, so that if any teeth are missing the fracture can be adjusted against it. Drilling holes through the bar enables the operator to adjust ligatures of strong twine on any of the remaining teeth, and in this way holding and supporting the parts without occupying much room in the mouth, and allowing free application of antiseptic treatment. To further support by external means, I make a bandage such as I show you now, and with a plaster mixture fill it and adjust to every part wanting support.

Plaster alone would not have sufficient strength, so I mix it with what I name cementine, so that it becomes very hard, light and strong. I will, with your kind indulgence, proceed to demonstrate my method.

You are all acquainted with the simple silver drops for polishing made of a very fine quality of German silver. By dipping this (exhibiting small wire splint) into a solution of chloride of zinc and

**Method of
Making the Splint.**

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putting it into a crucible of molten tin, you immediately get it coated with pure tin, which will withstand the acids of the mouth without danger to the patient. No trace of lead should remain. By placing three of these small wires together, if a short piece is desired, by doubling it on itself and warming it in a spirit flame, you get the parts united thoroughly and thus form a rigid bar. If you add to this a piece of steel wire, also coated with tin by the same process, you have a very powerful and slightly springy bar to which you can attach anything for producing the traction necessary to bring the parts together. I drill between the interstices of the teeth, so that a silk or twine can be passed through. To ligate these in the mouth, where perhaps there is blood or pus forming, or an excessive supply of saliva, is a little difficult, although it can be done, as can be seen by this model (producing a model). But it is possible, even though you tie a surgeon's knot, that it may slip, and therefore I adopt the old time method of using shot. If you make a shot of tin, it is a little hard to bend, but if you make it of ordinary shot lead, flatten it a little, and drill a hole in it, you have a fastening that you can slip on to the cord while your assistant is maintaining the tension on it, without having to pass the ends of the cords through. You then put the tension on to the fractured parts, draw them well into their place, push the little button of shot lead close up to the base and pinch it together with a pair of plyers, you then have an interdental splint that will hold in place almost any fracture that may present.

If it is a compound fracture and space is left by the loss of teeth, I then make it go entirely around the arch and drill where the teeth are left remaining, and in that way draw it into its place.

To get this little apparatus into its place and
Plaster Specially fasten it needs an external help, and I obtain that
Mixed for Bandages. help by putting a bandage upon the face. This bandage is made of plaster, but instead of mixing the plaster with water, as we usually do, I mix it with a composition made from the gluten of rice.

(Dr. Genese then proceeded to demonstrate this operation upon a living subject.)

There is an important element in the managing of this plaster when mixed with the gluten of rice in the place of water which is, that one need not be in a hurry and it will set very hard. In mixing this plaster haste is not necessary, and it should be mixed fairly firm. This plaster can be kneaded like a piece of dough (illustrating by rolling a portion of plaster, mixed with the gluten of rice, between the palms of the hands).

It is important to see that you have every fracture properly adjusted. In the operation which I am now illustrating, we are supposed to have

one of the apparatuses I have shown you on the inside, and a bandage tied over the head and coming down under the chin to hold it in place while we put this splint on. The heat of the face will set this plaster in about three minutes, and it is then an absolute support. If it is taken off, it will not crack, expand or contract. The top fastening can be released and nourishment administered without the fracture being disturbed at all, which is not possible with the so-called interdental splint. Dr. Fowler, of Providence, showed me today some very beautiful work under the old system of interdental splints, but I doubt whether he could as rapidly make his splints and put the internal and external ones on as I have demonstrated.

The plaster which I use in making this demonstration is now set; it is set firm enough for any one to move it for any purpose.

Contrary to ordinary plaster, this plaster does not dry out so rapidly that it will cause it to warp. I have here some plaster which I made and which will show you the advantages of it in this respect (exhibiting same).

The composition is not alone designed for the treatment of fractures, for they are of very rare occurrence; it is more for everyday use in the laboratory and in the office. If you take a model in the way I have shown you, you can make it so that you can directly take it from the mouth, remove it from the impression tray, and heat it gradually, and you can then pour in the softer metals.

To show you another way of using this plaster for dental work, I will take the liberty of mixing some in a different way, but before I do that I will say that I have in this work been compelled to find something in the form of a non-adhesive substance that would bring the plaster out very clean, because in placing it on the tissues it is very troublesome to have the plaster adhere, and the thing I found most useful for that purpose is a solidified glycerine made solid to the consistency which you see (exhibiting same). The advantage of it is that it leaves no grease nor stain, and the plaster poured on to a surface will leave it clean, as you see.

In making plaster for taking an impression, if you use it in the way you saw me do for a splint, it would be too strong and would not break away, but if you use it for an entire denture, you could do it in that way, and you would have ample time to carry it from your laboratory to your office without trouble; but in the ordinary way where teeth are left standing, I would pursue a different procedure altogether. I would first put the plaster into water, and let it take up all the water that it would; then pour the excess of water off and add to the plaster some rice gluten, when it will become very adhesive and very smooth; it will not drop off the tray and takes a very beautiful impression.

(Dr. Genese proceeded to demonstrate the above statement.)

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The plaster will not set hard while there is an excess of water, and it will not become limpid if you have too little water. You need exactness.

Now that the water of crystallization has been taken up by the plaster (the speaker had previously placed plaster in a bowl and added water to it), I will pour off the remaining water and add a spoonful of rice gluten. You will observe that the plaster is entirely free from air bubbles.

(Dr. Genese then exhibited the plaster by placing it in several impression trays and handing them to the members of the society for examination.)

That is for ordinary impression work, and it is also used in the laboratory for plaster models.

It has another advantage, and that is that in vulcanizing on a plaster made like this, your plate comes away perfectly clean, and if it should be necessary to leave pieces in over night in order to cool down, the plaster in the morning would be just as firm as if you had taken it out immediately.

Concerning the gluten of rice, I have had the pleasure of an interview with Messrs. Johnson and Johnson, and I think that they will make it and supply the profession with it. The material I am speaking of can be made up in large bandages; there is no limit to the size you can make it, and it is very inexpensive. The solidified glycerine, which is used for non-adhesion, will also be handled by Messrs. Johnson and Johnson.

In order to get out the plaster that you leave over night, you should soak it, when it will be soft enough to cut. My custom is to cut it around the edge of the plate, and then it comes off clean. In plastic work I think a great mistake is made in taking the pieces out too soon after vulcanization. They should be allowed to cool down instead of blowing the steam off or cooling with water. The plaster itself is ordinary plaster from the Consolidated Dental Company. There is another thing about the gluten of rice and that is, it seems to make any plaster better. I have had, at a pinch, to use the commonest plasterers' plaster, which I never would have thought possible to use in dental work, but in combination with the gluten of rice it makes a very hard surface.

(Dr. Genese here illustrated how broken teeth in a plaster model were repaired by plaster made by him.)

All kinds of glues have been tried, but they will harden plaster to an extent so that it will not set and it is sticky, and unpleasant and in vulcanizing is even destroyed.

Ordinary glycerine would not be of any value, but will act as grease would; and greasing a surface upon which to pour plaster always leaves a roughened surface instead of a smooth one. The affinity of glycerine to water is an advantage; the glycerine combines with the water and leaves the surface unstained and with every line clearly marked.

The time that it takes for this plaster to set in the mouth can be controlled; the heat of the mouth will affect it, and it ordinarily takes from a half a minute to a minute to set.

When I separate it from the tray, I give it a tap; and if you make a sharp groove all around where you want it to break, it will break off very cleanly.

Of course, the operator is supposed to know what his model is, underneath, and if it is under cut, I should cut the plaster impression down a little on the edge, and then, by a sudden blow, fracture the top part; this will not fracture the underneath part of it, because it will come away directly the fracture is made.

New Dental Remedies.

By ALPHONSO IRWIN, D.D.S.

Report of Committee on Materia Medica, New Jersey State Society.

The subject of dental remedies is often sidetracked in societies for the discussion of the more fascinating and profitable topics of gold fillings, porcelain inlays and crowns, crown and bridgework.

The dental journals make spasmodic efforts to rescue dental remedies from oblivion. Nowhere, except in dental colleges, do we find that persistent effort is made to impart systematic information upon this subject. But with the termination of the collegiate course the acquirement of a knowledge of the action and uses of dental remedies cease. This ought not to be, for "Dentistry is the science and art of medicine applied to the dental organs."

In consequence of dentists devoting their energies more to the art than the science of dentistry dental materia medica is still in the evolutionary stage. A thorough and positive knowledge of medicine will transform the dental artisan into a specialist of medicine.

If you believe dentistry is a specialty of medicine, scientific knowledge concerning the action of drugs in diseased conditions of the mouth and teeth is essential.

If you do *not* believe dentistry is a specialty of medicine, you are aware that no dentist can relieve suffering who ignores scientific medication. Whosoever regards it as unimportant is bound to be tripped up sooner or later in his professional career, to his mortification and shame as well as loss of prestige and fees.

About 350 new remedies are discovered annually. Many new reme-

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dies announced one year are supplanted by the remedy with a corresponding therapeutic action discovered the following year. There has been a slow but decided revulsion of feeling against the efforts of enthusiasts to advance the claims for therapeutic efficacy of new chemicals. This caution has not prevented experimental investigation in practical medication. On the contrary, the judicious acceptance of that which is good and the rejection of worthless remedies has naturally followed.

We can state as a result of a correspondence with dentists, physicians, editors and college professors living in all parts of the United States and involving the sending of over 200 letters upon the subject that *no* strictly *new* remedy of wonderful value in dental practice has been discovered during the past year.

There have been produced, however, new uses for drugs of recent introduction, new combinations of old drugs with different therapeutic effect in pathological conditions from that of the individual constituents and new uses discovered for old remedies hitherto unpublished to the profession.

The remedies which are of the greatest interest to the dental profession according to the allopathic classification are: Anaesthetics—general and local, analgesics, antiphlogistics, antiseptics, disinfectants, hemostatics, germicides, laxatives, nervines, stimulants, tonics.

Airol. Airol (Bismuth Oxy-Iodo-gallate) is an antiseptic which I found popular upon the continent three years ago. It has been commented upon occasionally in the United States during the past year. It is a good substitute for iodoform and possesses the advantages of being non-toxic, odorless and non-irritant—properties which commend it to the dentist wherever iodoform is advantageous. I prefer aristol. In general surgery in Russia airol has been used very successfully in the army in comparison alternately with iodoform on 200 soldiers.

Septoforma. Septoforma is a product of formaldehyde. According to Engels, a three per cent solution destroys staphylococcus pyogenes aureus in three minutes, the cholera vibrio in one minute, and the typhoid bacillus in ten minutes. Instruments of various metals exposed for three days to thirty per cent solution of septoforma, and none of them showed the slightest change except those made of aluminum. It seems to have advantages over other similar disinfectants, owing to a much less penetrating odor, absence of local irritation or injury to metal instruments, and that it has a considerable degree of germicidal power. It is recommended for the disinfection of instruments in the strength of five per cent to ten per cent solution and as a wash for wounds in a three per cent solution.

Adrenalin. Adrenalin was discovered and introduced by Jokichi Takanimi, who read a paper before you at our last meeting upon my invitation.

Adrenalin has claimed much attention during the past year as an agent for the painless extirpation of the pulp, as an obtundent for sensitive dentine, as a local anaesthetic and hemostatic. (ITEMS OF INTEREST, June, 1903, page 401, by W. Clyde Davis, M.D., D.D.S.)

Positive results are claimed from its application for painless pulp extirpation when the following method is followed: Apply the rubber dam, dry the cavity. If the pulp is covered by softened dentine apply one drop of adrenalin, then one drop of a forty per cent solution of formaldehyde. If quite a distance from the pulp use slight but continued pressure with a soft rubber plug for a few seconds. Excavate as near to the pulp as possible. Apply a second drop of adrenalin. Lay in the cavity a few crystals of cocain, apply one drop of the forty per cent solution of formaldehyde. Apply pressure with the rubber plug first slightly, gradually increasing the pressure until at the end of one minute you can knead the rubber in the cavity with burnishers without inflicting pain. If upon running a nerve broach slowly up to the apex of the root there is pain, repeat the application. Then you can remove the pulp painlessly. Where there is excessive hemorrhage apply adrenalin under pressure for fifteen seconds. Insert non-irritant dressing for twenty-four hours and fill. If indications are favorable, fill immediately. The tendency to elongation and soreness of the root is diminished, the peridental membrane in many cases losing "tactile sense" where adrenalin is used.

The advantages claimed are: Adrenalin is painless; a time saver; tooth discoloration does not occur; after soreness is slight and many times wanting; lastly, your application is a powerful antiseptic. (For full details see ITEMS OF INTEREST, June, 1903, Dr. W. Clyde Davis's paper.)

Bromo-Chloron. Dr. D. W. Barker says (in a paper read before the Second District Dental Society of New York, Dec., 1902): "Its discoverer, Dr. W. H. Birchmore, so designates a new disinfectant which combines bromine and chlorine in a new way. It is not a preparation of a chloride of lime. Nascent bromine and chlorine do the work of disinfection. Lime is the connecting chemical. Water will dissolve more than its own weight of bromo-chloron. It is unstable and breaks up upon contact with the faintest trace of a foreign acid. The lime combines with the acid. The bromine and chlorine are freed to destroy any bacteria or animal matter present." Either directly or by the formation of nascent oxygen. *The solution has not the least effect upon living animal membranes.* The chief claim for its use lies in the fact that its action is confined to dead material. It never attacks



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the teeth, lips and gums. Yet it destroys dead material and bacteria. This new reagent has every advantage of all other reagents and disinfectants without any of their defects.

In treating abscess you open and cleanse root canals with bromo-chloron, flushing out the abscess thoroughly through the fistula with bromo-chloron. Where practicable discharging several syringefuls into it until not a trace of pus remains. No precautions need be taken to protect the mouth.

Dr. Barker claims bromo-chlorin is as powerful a germicide as bichloride of mercury.

Ecthol.

Ecthol is an antiseptic used internally as well as externally. The following experience with ecthol is recorded in a case of septic poisoning after extraction:

G. S. F., aged eleven, had tooth extracted June 20, after a preliminary hypodermic injection of a four per cent solution of cocaine. On July 4 she began to complain of tender gums and neuralgic pains of head and face. Upon examination the tissues surrounding the cavity left by tooth were found ulcerated and inflamed and covered by a dirty greyish slough. The surrounding teeth were tender and gums boggy and engorged with blood. Temperature 103° F. Tongue coated. Pulse 120. Loss of appetite, and patient had a severe chill once in twenty-four hours, followed by exhausting sweats. Swabbed cavity and surrounding tissues every three hours with pure ecthol. Gave saline purges and one-drachm doses of ecthol well diluted with water every four hours. Improvement was noticed on third day of treatment. Fever, sweats and rapid pulse were controlled. The unhealthy granulations disappeared and convalescence was established in ten days. Undoubtedly the symptoms in above cases were produced by the presence and absorption of septic material, and in each surgical procedures were refused. I would not wish to be understood as taking a stand against surgery in cases where an operation is unavoidable, but I do believe that ecthol in some way is antagonistic to the chemical exudates produced by bacteria and is worthy of an extended trial at the hands of the medical profession.—Edmond J. Melville, M.B.C.M., Bakersfield, Vermont, in *Medical Brief*.

Ethyl Chlorid. Dr. M. J. Reboul (*Revue médicale*) has used ethyl chlorid as a general anaesthetic in more than five hundred cases. He states that by means of this agent

anaesthesia is easily induced, and that patients do not experience any unpleasant sensation. It should be given in small doses, 5 c.c. every five minutes, and the total quantity administered should not be greater than 25 c.c. In children and old people the dose should be half the quantity recommended for the average adult.

The administration by means of a compress is the simplest and most convenient method. It is recommended that air should be excluded. The transmission of an intensely cold sensation to the hands of the operator from the evaporation of the ethyl chlorid in the compress occurs simultaneously with the beginning of the anaesthesia; two or three minutes afterward the anaesthesia is complete. The anaesthesia disappears upon the removal of the compress, but this period is followed by one of analgesia, during which, although at this time the patient is not fully unconscious, surgical operations can be performed without his being aware of it.

Dr. Reboul has not observed any unfavorable symptoms consequent upon ethyl chlorid.

An ethyllic compound called narcotile promises to become a formidable competitor of nitrous oxide gas as an anaesthetic for the painless extraction of teeth and other dental operations where general anaesthesia is desirable. The value of chloride of ethyl as a local anaesthetic has been long known and the bromide of ethyl has been used as an anaesthetic, but the introduction of an ethyllic compound for producing general anaesthesia has been of more recent date. It appeared in England in April, 1901, and later in the United States.

The advantages claimed for narcotile are its "unalterable composition, rapidity of action, harmless and easy employment." Among the thousands of cases where narcotile has been administered, its application has never been attended with accident. In producing general anaesthesia with narcotile, two hours after the last meal should elapse, the patient must be free from any constricting clothing around the waist or neck, and placed in a position as near horizontal as possible. All artificial teeth must be removed, and if for extraction the gag must be applied before narcosis.

Six to seven c.c. (mitilitre = 16.2318 m., about 113 m.) is sufficient to cause anaesthesia in from half to one minute and lasting from five to ten minutes. By repeating or prolonging the administration of narcotile anaesthesia may be prolonged without inconvenience from ten to fifty minutes.

The general effects of narcosis produced by narcotile nearly resembles those of sulphuric ether. Much more speedy than chloroform or nitrous oxide gas, narcotile acts upon the sensory nerves and spinal centers, then upon the motor centers and motor nerves, and finally upon the medulla oblongata. Complete anaesthesia is so rapid that the different stages of narcosis can hardly be noticed. There are very seldom signs of excitement at the first stage of its application. The condition of complete anaesthesia may be recognized by the moderation of the pulse and the respiration. The patient lies quietly as if in a deep sleep; the movements

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of respiration are regular and rather less frequent than in normal sleep. The patient inspires deeply, and sometimes is snoring. The pulse becomes full and soft and scarcely accelerated, sometimes even slower than at the commencement of inhalation. The muscular system is not entirely relaxed, except in children. The best way to ascertain the fact that anaesthesia is complete is to raise the arm of the patient and then allow it to drop by his side. If the stage of complete anaesthesia has been reached, the limb will fall like an inert mass. If any degree of rigidity persist, a fact which may be readily ascertained by flexing the arm at the elbow joint, the patient is not fully under anaesthesia.

Sensibility may also be tested by pinching the skin sharply between the nails of the finger and thumb. The indications thus obtained are more reliable than the results of touching the conjunctiva of the eye.

Consciousness returns very quickly; the patient does not experience any period of stupor or coma, which usually follows the application of other anaesthetics.

Narcotile, acting chiefly on the cerebro-spinal centers and on the motor nerves, does not affect the heart, but we should advise the surgeon to make inquiries as regard undue indulgence in alcohol, or if the patient is undergoing treatment for cardiac disease, these cases being a contra indication for the use of "narcotile."

New Remedies.

Papoid. The digestive properties of papoid have been the subject of investigation by chemists, and its power and value have been proved beyond a doubt.

An aqueous solution of papoid soon spoils, but a glycerine solution will not readily ferment. A glycerine solution is particularly employed for dissolving false membrane in the throat in diphtheria and in cleansing of foul wounds in surgical practice. Any of the usual chemical anti-septic agents may be prescribed with papoid. Where it is desired to increase its activity, the addition of five grains of sodium bicarbonate to each 100 minims of the solution is a decided advantage. It acts at any temperature, but when possible, as in surgical cases and certain forms of skin disease, it is advised that the part to which it is applied should be kept warm with hot cloths or some other means, as a moderately elevated temperature favors its action.

It is claimed that papoid, prepared by Johnson & Johnson, is a preparation superior to papain, which Dr. Harlan reported upon so favorably in the dental journals.

**Recommended
for Trial.**

It is suggested in addition to those remedies already mentioned a careful trial and a tabulated record of the following drugs be made and reported upon at a future time:

Antiseptol—An antiseptic for internal and external administration.

Acetozone—A powerful germicide.

Alka-thymal—Antiseptic and detergent. Used in pyorrhoea and as a mouth wash.

Aromatic Tincture of Red Gum—Soluble in water or alcohol. An astringent mouth wash, styptic for hemorrhage after dental operations.

Alka-thyptol—A preparation of thymol and eucalyptus, useful in the treatment of oral catarrh, chronic nasal catarrh and diseased mucous surfaces.

Enzymol—A deodorizer, a solvent of septic materials, potent, painless, harmless; has a remarkable healing curative effect. Dilute with an equal volume of water. Use for abscess, necrosed bone, gangrenous pulp, pyorrhea alveolaris, disease of antrum. Highly recommended by Drs. T. R. Chambers, R. T. Morris and J. W. Glitsman in treating mucous surfaces of eye, ear, nose, throat and mouth.

(Lithium Bitartrate Salicylic Acid and Sodium Bitartrate) and

Lithos—Uric acid solvents for internal administration in the systemic treatment of pyorrhoea alveolaris (caused by Lithunia).

Nargol—A new silver compound. Solutions injected for disease of the antrum and along pus tracts. Its use is suggested for treatment of putrescent pulps and sensitive dentine in the molars.

Phenoline—An antiseptic disinfectant and germicide. Used as a mouth wash and in the treatment of catarrh; for wounds, scalds and burns. Dilute with two to ten parts of water.

Olecco—A pleasant laxative antacid, used in constipation; the antiphlogestic treatment required in conjunction with local treatment of disease of the mouth and teeth. Recommended highly by Dr. L. S. McMurtrie, Louisville, Ky., and Dr. Veschner, Chicago, Ill.

Pyrozone—Prepared according to the standard of the U. S. Pharmacopœia. Not only maintains its reputation but its use is on the increase.

Ut-A-Sol—For neuralgia and rheumatic pains; dose 10 to 20 grains; total dosage limit per 24 hours one to three ounces. Is not a depressant but tonic. It is an internal antiseptic. Sterilizes urine.

"Solidified Phenol"—A convenient and efficient application for pulpitis.

"White Enameled Glycerine Proof Cases for Anhydrous 95 per cent Glycerine Suppositories"—A convenient and efficient laxative.

Glyco-Thymoline Applicator (Kress & Owen) designed by E. C.



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Rice, of Philadelphia, consisting of a rubber ball and tube conveniently shaped to inject fluids into pus pockets, abscesses, fistulas, which an intelligent patient can take home and use themselves.

The Oakland Chemical Co. also have a small syringe designed for injecting remedies into contact with diseased surfaces. They are exceedingly useful and the subject of new remedies would not be complete without mention of the new applicators for using the drugs in dental medication.

Text Books on Dental Materia Medica. Lea Bros. & Co. have issued an edition of Long's Dental Materia Medica.

P. Blakiston Son & Co. have published a new revised and enlarged edition of "Gorgas' Dental Medicine" (7th ed. by F. J. S. Gorgas, M.D., D.D.S., Baltimore, Univ. of Med.).

Ash & Sons, of London, England, have published "Notes on Materia Medica, Pharmacology and Therapeutics," by Douglass Gabell and Harold Austen (ITEMS OF INTEREST), p. 471.

No reports of new homeopathic remedies useful in dental practice have been received. It would be exceedingly interesting to hear reports concerning the latest of these remedies.

In conclusion, remedies recently introduced

Views of	possessing more or less merit, have been necessarily
College Professors.	omitted because it would require volumes to
	enumerate them and their action in detail.

Time, experiment and clinical use alone can determine the practical value of new remedies and a few months' use would not qualify even an expert to speak positively in regard to their therapeutic value. The conservative attitude maintained by colleges in regard to them is shown by the following:

Prof. Wilbur F. Litch informs me: "I do not know of any new remedies added to the Dental Materia Medica during the past year. Adrenalin as a styptic and ethyl chloride as an anæsthetic are more than a year old."

"'Aresthol,' a mixture of ethyl chloride, ether and chloroform (suggested) is being tested in this country and with favorable results (by Schleich)."

Prof. L. Greenbaum writes me: "The only drug introduced during the last year is 'caroid solvent' for the digesting of dead pulp tissue." See *Cosmos*, September, 1902."

Dr. H. C. Wood, Jr., advises me: "The most important additions to the dental materia medica of the last five years have been the various local anæsthetics, such as holocaine, nirvanin. The vaso-constrictant action of the suprarenal glands or their active principle adrenalin would

sometimes make them very useful in dental surgery. (I may mention in this connection as useful to check the hemorrhages which occasionally follow even minor operations about the mouth, the styptic properties which gelatine has been shown to possess)."

Prof. E. C. Kirk says: "I am unable to suggest any new additions to our materia medica during the past year, which are of any considerable importance."

Prof. N. A. Smith, of the Ohio College of Dental Surgery, writes: "Dr. Bodecker, of Berlin, used at a clinic at Stockholm in August, 1902, a solution he called 'cocaine phenate' in the treatment of pyorrhœa alveolaris. Its use and preparation is described in the February, 1903, *Dental Review*, page 117."

"In the same journal, 1892, page 894, is published an article by Dr. Jessel on the use of carbonized cotton, which also may be new."

Prof. James Truman in a communication to me says: "The number of new combinations in materia medica, introduced the past year, are numerous, but I have no time to experiment with them."

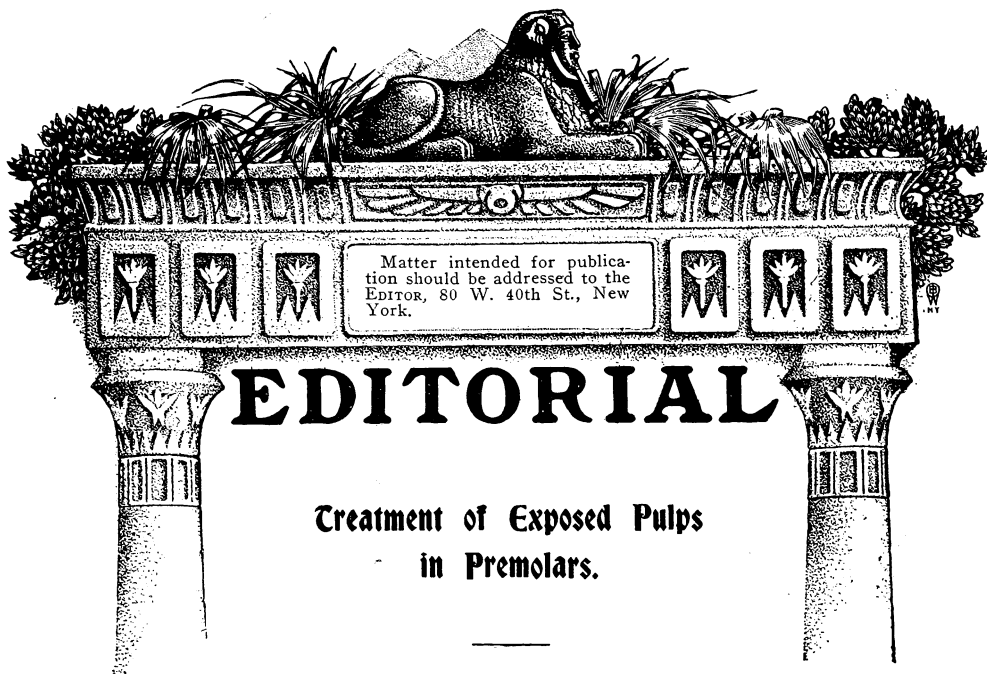
Viaform (Iodoschloroxy chinolin). It is antiseptic. Used by rubbing a few grains of powder in alcohol. Has very little odor. Has not the toxicity of iodoform. I have not tried this.

Validol. This remedy I think will have a place in dentistry, but I have not tried it sufficiently to form an opinion. It is a combination of menthol and valerianic acid. I sent to Germany for this, hoping I could make use of it in pyorrhœa alveolaris. Further tests are necessary in this direction. It is a marked reliever of pain. It has the marked antiseptic properties of menthol.

"Orthoform. While this is not new, I think its valuable properties are not well understood. I have found it most valuable in pulpitis or on irritated surfaces of mucous membrane."

Dr. A. W. Harlan regards the Roentgen rays as valuable in the treatment of gum lesions.





In a recent editorial, attention was called to the growing practice among dentists of removing pulps under pressure anæsthesia. At the same time it was stated that there is need of a close study of this comparatively new method, and a collation and report of clinical data relative thereto. This will probably be done, as we fortunately have in our ranks men more ardent for the truth than for the temporary reputation for skill that might be engendered by citing successes and suppressing histories of failures.

At the moment, therefore, we may leave the general subject of removing pulps from the roots of teeth of the second set, and consider the management of exposed pulps in teeth of the first set. The proper treatment of an exposed but otherwise healthy pulp, in a second premolar, has been an unsolved problem in all the annals of dentistry. It is with pleasure that we announce to our readers, as a sort of New Year's offering, that at last a solution apparently has been found. The mode of treatment is herewith described.

In the application of pressure anæsthesia for the removal of pulps in the mouths of adults, while success is met in a large percentage of cases, there are not a few, in which failure in one form or another may

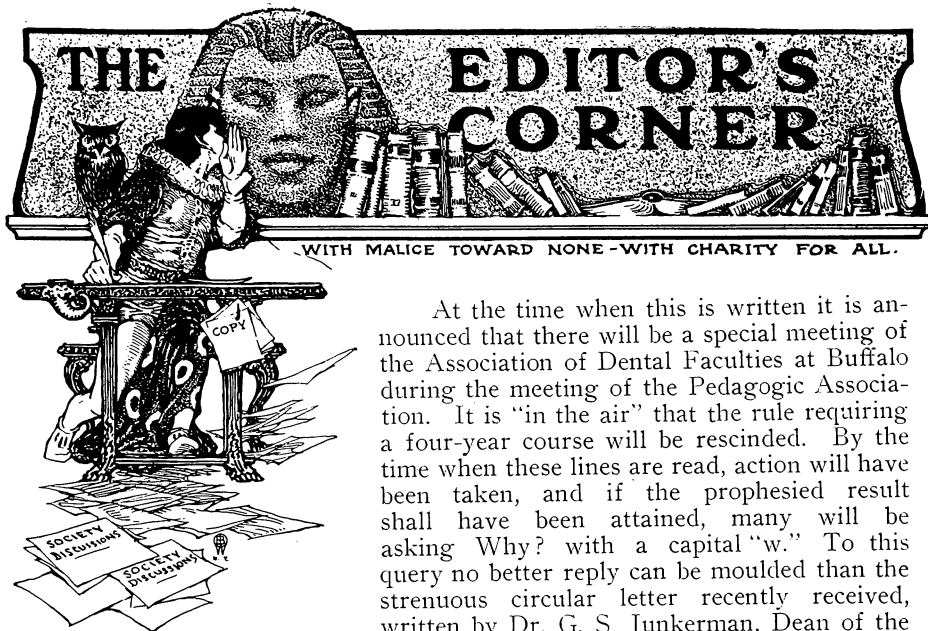


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result. We may fail to produce anæsthesia, or we may meet after effects of a troublesome character. In a number of applications of this method for the removal of living sensitive pulps from premolars in the mouths of children of less than seven years of age, the results have been so startling, so surprisingly satisfactory that there seems no object in delaying the announcement that others, practitioners and patients, may share the benefit. In no case has there been the slightest sensation of pain, the young teeth apparently being peculiarly susceptible to the action of the cocaine. In all cases the pulps have come away practically whole. In no case has the after hemorrhage been excessive.

Usually these cases come to us exhibiting compound cavities involving the mesial, approximal and occlusal surfaces. Most often the distal approximal surface of the first premolar is likewise carious. In such cases we find the gum septum between, more or less sensitive. The cavity or cavities should be thoroughly washed out with warm water and borine, and food debris and such decay as may be painlessly removed, may then be taken out. Next place two or three drops of adrenalin on the mixing slab and in this macerate fresh crystals of cocaine. Saturate a small pellet of cotton with this solution and apply in the cavities, covered with a piece of unvulcanized rubber sufficiently large so that pressure may be produced with the tip of the finger. The napkin should be used and care observed to avoid an excess of the cocaine solution, or its escape into the mouth. Pressure should be thus exerted for exactly three minutes. At this time the gum septum will be insensitive and all carious matter may be readily removed from the cavities and the pulp fully uncovered. The rubber dam should then be applied. This is not obligatory, but it is advisable, as will be appreciated by all who make it a habit, rather than an exception, to use the rubber even for children's teeth. A second application of the adrenalin-cocaine solution, for three minutes, will enable the dentist to use broaches freely and with care the pulp may be moved, often coming out from all canals absolutely entire.

The filling of the canals is not a part of the present topic—which pertains solely to the removal of the pulp, without recourse to arsenic, which would be bad practice or even malpractice. It may be said, however, *en passant* that immediate root filling would be a hazardous procedure, as there is always danger of recurrent hemorrhage, though as yet not one such misfortune has been met. Readers who try this method are requested to communicate their results to the editor.



Cincinnati Dental College. This circular is published under its own caption "Let Us All Be Honest," to which we may add, "Yea, Verily! Amen." This is recommended as good reading not alone to those interested in the educational problem, but likewise to all who may be able to appreciate vivid language.

Let Us All Be Honest. The adoption of four years for graduation has placed the dental profession in the firmament of progress as a shining mark. These are the kind that death likes. On the other hand, universities and other literary institutions have cast the mantle of decadence upon personal and mental culture by discussing of late the propriety of reducing the usual four year academic term to that of three years. Whereas, formerly graduates of this kind of an institution were found at least competent to fill the place of waiters in a restaurant it will now be found that they will have to retrograde to a place commensurate with the retrograde metamorphosis of their Alma Mater, and will probably not be able to fill a more responsible place than janitor in a livery stable.

This retrogression means much to our dental schools, as students with B. A.'s and A. M.'s will come to our dental schools illy prepared to enter the study of dentistry, and we shall have to exact from such applicants an additional year of study, which would make the requirements of 1904-1905 five years instead of four. Dental progression should be maintained at all hazards, and we should prepare our students not alone for the labors of this world but we might add an additional year and devote such time in preparing them to care for the teeth of angels.

This strenuous attitude of The National Association of Dental Faculties in the progression of dental education will have a far reaching effect upon the State Examining Boards, but it will be found that they will suffer the extreme penalty of the law; as dentists will be unwilling to accept appointments made by political preferment after a rigorous campaign of many years study and acquirement of such a vast education as will be the possession of students who spend so many years in college. When the acme of perfection in dental college education is reached so many

additional years will have been added to the curriculum that a professional dentist's time will become so valuable that he cannot afford the time necessary to devote to the functions usually attributable to a good examining board member. It seems that the profession has bought a white elephant and have paid the price of a tanned one for it. They have monkeyed with the proverbial buzz-saw without having attained the requisite manual training while at college to manipulate it skilfully.

**Selection and
Education of Students
Scrutinized.**

We have enough laws on our books to stock all our State legislatures for the next hundred years to come. A just, honest and impartial administration of these laws would be all that the profession want. Our Examining Boards do not require a four years course of study, yet these boards are the representatives of the profession at least in the eye of the law and in the eyes of the laity. If they are not just, honest and impartial representatives let us devote this year which we have added to the curriculum to having them changed or ousted if necessary. Have the colleges been just, honest and impartial? Our actions are on record. Let each one of us closely inspect them for himself and answer the question. Do our records shine forth with a real polish or can we detect the odor and stain of whitewash? The cry has not been to dilute our concoctions with time, but to bestow upon the profession and the laity an article of proper quality. Colleges have the power of selecting their own material, and if this is rightly selected, the right article can be produced in three years as well as four. We have rules for selecting our material; do we abide by them? Most of our schools are equipped to manufacture the proper article. Do we select our material and insist that it shall comply with the sample? We cannot create professional dentists and annihilate the factor of time nor can we produce them from defective material. Boards which are the representatives of the profession and laity became a necessity because some of the material turned out of colleges was spurious. The necessity increased in proportion to quantity of this spurious matter. The States are rapidly falling in line, and it will soon become universal to examine all candidates for practice. What difference then will it make whether a man has spent one year or two years in college. It is the ability that is to be determined. It is not a question of four years in college for even that number of years will not suffice to make dentists of some students. The error of the situation is that of placing all students in one mold regardless of ability or previous knowledge. The Faculty Association is now discussing the propriety of adopting a credit system and passing to the rear the four years course requirement. If such a system can be honestly administered, which I doubt very much, it would appear the most just, and we feel very certain that a four year requirement is not in the line of progress, and will result in the exclusion of the best and most valuable talent from the profession.

**Relation of Faculties
to Examiners.**

It seems at present that the National Association of Dental Faculties and the National Association of Dental Examiners are eyeing each other askance with an air of suspicion on both sides. At least there is not that feeling of cordiality between the two bodies that some think

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should exist; nor yet that feeling of perfect indifference which we would think should exist between two bodies whose duties are in reality so widely different. The annihilation of the reputable college list last summer by the National Association of Dental Examiners should not be construed as a slap at the National Association of Dental Faculties even though that body did intend it as a felonious assault. Examining boards were never created to pass upon the reputability of colleges, and they are the bodies least able to do so. The maintenance of a so-called list of reputable colleges is and always has been a farce, as many times there have been not only reputable schools but highly proficient ones whose names did not appear on such lists. Examining boards have no authority nor right to pass upon methods or manner of imparting dental education any more than mercantile agencies are interested in knowing how firms or individuals secured the money to give them high financial ratings. If the money was not secured rightly it is a matter for the criminal courts to act upon. If the college graduate presents the goods the examining board need not and should not be permitted to examine further. What is true of the examining board is likewise true of the National Association of Dental Examiners, as this body can have only so much power and discretion as it can absorb from its constituents, which are the various examining boards of the various States. Too much time and energy have already been expended in trying to reconcile these two so-called National bodies. They do not need to be reconciled. Let each body attend to its own business and it will soon be found that their respective labors will be separate and distinct. Reputable schools are those whose graduates can pass fair dental examination before a fair examining board. If the examining board is not fair and intelligent, law or legislation must be resorted to to rid the community of something that all agreements or regulations could never accomplish. If a college graduates or insufficiently educates students that apply for entrance into practice, let the board turn down such applicants, and it will only be a matter of a short time until such a college will have no students to educate, and it must then suspend operations.

These two National bodies seem to be facing each other like two hostile armies instead of both becoming good citizens of one country and each attending to his own citizenship. It seems to us that an examining board shows great lack of discretion when it tries through a National Association to force colleges to require anything of its students, whether such requirement be a four years course or a four mile walk. If such dictates were permitted or complied with the colleges would become slaves to the examining boards. College teachers would become automatons and the qualities of judgment and liberty would become vagaries. Yet this condition of coercion is just what does exist and has been partially instrumental in forcing a four year course down the throats of the colleges when in reality such a resolution was passed against better judgment and cooler consideration of the subject and a full realization that it was not along the line of progress. Now when the colleges consider it wise to rescind their former action they are confronted by a bristling up on the part of the National Association of Dental Examiners with the cry that we are retrograding in dental college education. I trust that



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the National Association of Dental Faculties may not be cowed by any such mobilization. The examining boards have nothing to do with us as colleges; they have only to do with our products. Let us in an unbiased way do what we think best for dental education. If any presume to interfere with our liberties we can take care of them later. If three years is long enough to train, why prolong it to four and produce a condition of staleness? Such a condition of staleness will be produced, we have no doubt, as has been shown by those schools that have already tried the four year course. Students become weary of the long confinement before they have completed three years and long for the independence and experience that only office practice can give them. Birds will never learn to fly if they are not permitted to leave their nests, and the mother bird usually permits them to leave the nest before they know how to fly. A student can grow stale, and he will then make progress backwards. I presume examining boards cannot understand this condition but a teacher can. Let us have courage to do the right and not make any more false passes. Let us make our students do work and not time. The requirement of three years *work* is more along the line of progress in dental education than the requirement of four years *time*. Let us take one more step forward and rescind the sentence of four years *time* and make it three years *work*.

Passing Comment. Here endeth the circular, and in one particular comment seems needful; the rest may speak for itself. Dr. Junkerman strikes the keynote, with loud pedal hard down, when he says that the Examiners Association have their own work in the world, and that they should attend to that and leave the methods of teaching to the discretion of the teachers. But he is not the first who has said this. The late President of the Examiners Association, Dr. Charles A. Meeker, in his annual address at Asheville intoned the same song. He also warned the Association that it might be best for them to "mind their own business." Dr. Junkerman also says that because the Faculties think of changing their rules the Examiners Association "bristles up." What does this mean? Has some member, or some over zealous committee been "interfering?" If so he or they have their answer in the above circular.

We have for some time been seeking an auspicious moment for the republication of a paper on Education, which is so good that it should have a wider circle of readers than could be accorded by one magazine. As this paper takes up the subject almost where Dr. Junkerman leaves off, it is with pleasure that we find we have not waited in vain for the psychological moment for reproducing the following excellent paper from Dr. C. R. Hungerford, first published in the *Western Dental Journal*:

**Hungerford
on Education.**

It seems to me to be axiomatic that the primary object of teaching is to get rid of the teacher; but a somewhat extended knowledge of the present methods of dental education would indicate that the alpha and omega of didactic lectures are to redound to the glory, reputation and financial betterment of the lecturer. Even among those who are earnestly trying to teach the result generally is an exploitation of individual methods





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and special formulas, rather than the inculcating of the broad, fundamental principles which underlie all mechanical and physiological processes, the result being that the student is left helpless unless he can correlate every case that comes under his care with exactly similar cases that he has seen in his college work.

There is no question in the mind of the writer that we have ten times too many colleges, and not one-tenth enough teachers, and indeed, not enough departments in the present curriculum. Form, color and design are most woefully lacking, as is to be seen in the work turned out even by our best men.

A successful dentist should have for a foundation a liberal education, yet colleges accept as students men who can show a high school diploma, and I know of no college whose requirements for admission include a kindergarten examination to demonstrate the candidate's fitness to enter the dental ranks. It may be idle to discuss a uniform standard either for admission or graduation, for until this can be placed in the hands of either the Federal Government or of a sufficiently large board uninterested in any individual college, such a desideratum cannot obtain. Our present technical education is the degenerate descendant of a long line of clever, nimble nobodies who have at their finger ends only the highly methodized and formulated news of the latest text books; they can go through a prescribed course of preparing cavities or making plates, but outside of their beaten track they are simply fillers of space, whose type is invariable and whose number is legion. Of ideals, ambitions or aspirations, they have none. There is no use in wasting time in medical or mechanical devices for treating pyorrhea or constructing bridges if the standard of health diminishes as our science increases. Why spend our time in multiplying amusements when the nerve power and buoyancy to enjoy them diminishes in an equal ratio? Cannot the present century devise some way to tap the fountains of health at the spring itself? Money cannot buy it, nor can science create it; but I am optimist enough to believe it possible; for, as nothing happens without a cause, if we can find teachers strong enough and great enough to face the failures of the past and inquire into their cause, we may soon hope to be provided with the means to this end.

Between knowledge and wisdom there is a gap as wide as between the polar seas. The commissary department may be stored with preserved beef, but the soldiers are dying in the field—it is useless and worthless, and will continue so until men commence to understand the purpose of life and bend to it every energy of their being.

Reform is the heart-cry of the hour. Vast sums of money are expended by the Government and private munificence to benefit and uplift, but something must be radically wrong, that with all this earnest desire to strengthen virtue and to lessen crime, with the preaching of the beauties of temperance and the necessity of obedience to the laws of hygiene we see our courts and prisons more and more crowded with criminals, and an ever-increasing demand for more asylums for the insane, more hospitals for the sick—there must, indeed, be something "rotten in the State of Denmark."

Who of you dental teachers have the courage to probe the abscesses of our present methods? In the beginning of things, the Heart, which



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is Eve, gave to man not knowledge, but the fruit of the Tree of Knowledge; but man has lost it by trying to keep it entirely for himself. This is the Promethean fire that was brought down from heaven, but it must boil not your pot alone, but the pot that prepares the food that shall nourish and feed your brother dentist. If this is not done, then the hiss of the serpent of selfishness will be heard in our midst, and its sting will poison and paralyze every effort.

The college-bred man of today has few calls on his resourcefulness or handiness, either physically or mentally, to meet the emergencies of professional life. He lives in an appropriate pigeon hole. Says the *London Review*: "He goes to a school where all is mapped out, with its work and its play; he goes out into life a specialist, fiddling at a piston or a valve, but if the machine breaks down, he can suggest nothing, but must wait till higher powers resume their normal functions; beyond falling in love and a desire to best his fellows, he is never in contact with any of the elemental forces of Nature his whole life long." Few men know anything of the bliss of creation; the power to do things. Why not, then, make the requirements of dental college work the ability to do something, rather than to memorize the teachings of theoretical, didactic lecturers whose methods are as changeful as the wind, and as unstable as their fillings?

Man has, some day, to become the master of every situation that life holds. Let us commence now. Why wait for the life to come? Were I a Carnegie or a Rockefeller, I would found colleges whose requirements of admission would tend to show a student's fitness for the calling he proposes to follow, even if I had to "boodle" every legislature in the land. Education? Yes; that is the most needed thing in the world, say the intellectualists; but how much nearer have these gentlemen put us upon the road to happiness? Let the great army of lawyers, physicians, dentists, ministers of the gospel, whose profession it is to relieve pain, trouble and sickness, make answer; and if they answer truly, it will be: "Not one day's journey." The rotting tube that is patched at the top bursts again at the bottom. What we fondly call education is but a hide-bound instruction, a gathering up into the memory of a barren erudition. The student is crammed with citations and empty ideas, with formulas and receipts; he swallows the elixir of life, but remains cold and inert as a brazen shield with graven glyph—there is no versatility, no blossoming out of one's capacities or unfoldment of one's faculties. Education should be the guaranty of and stimulus to action. What we call talent on intellectual lines, skill on material ones, and power in moral acts have a degree of forcefulness only in the range of our own faculties and our native versatility. Education should improve these organs and these functions, discipline the will, stimulate our ingenuity, make us clear in invention and fertile in imagination.

Of course it is unavoidable that those who work in the world should have a chosen line of study, but there is no reason why they should remain ignorant of everything else. To understand anything thoroughly, it is necessary that one should have knowledge of other subjects, for everything is but a part of a universal whole.

Let us take the case of a dental student. He commences to specialize



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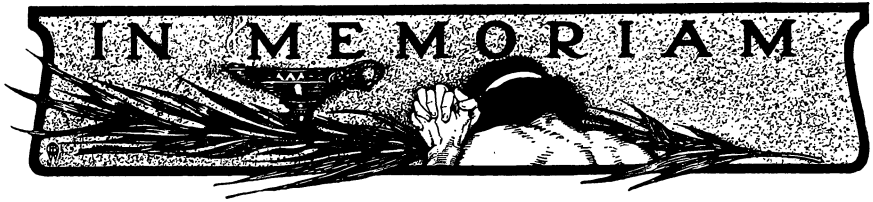
almost at the very outset of his college career. Orthodontia, pyorrhea, crown and bridgework, oral surgery—whatever it may be, he directs all his attention and energy to that special department, so far forgetting the intimate relationship of all parts of the oral cavity, that cavity's connection with the body and the body's dependence on the world in which it lives. Not only is this over-specialization the rule, but it works to its own detriment upon helpful lines. All disease will, too generally, seem to such a student to come under his own especial fad.

For an all around education, then, I make a special plea; for the all around man, for one who has an ability to use his mind, with wits so trained that he can readily turn his hand to any emergency and be the master of any situation that may arise. Perhaps the most valuable advantage of an all around education is the breadth and scope it gives the mind itself, the enjoyment and usefulness it brings into life, the stimulus it brings to some brother less fortunate than its possessor—the useful hint, the practical help, the sympathy and understanding of human needs and endeavors.

Dentistry needs men, not mechanics who must grind out so many given yards of memorized statistics every college term. In the education of the future dentist, many things that are today considered important and essential will be looked upon as non-important, perhaps even detrimental, and some of the present side issues, fads perhaps, will be known to be fundamentals. Let me make an illustration: I hope, in the future education, that a student will never be pitted against his fellows for competition or for prize; that he will not look upon his fellows as rivals to be surpassed or as obstacles to be overcome, on his road to success, but rather will he look upon his fellow students as fellow-souls, traveling the same road, in no wise differing from himself in essence, learning the same lessons, struggling to arrive at the same goal together, or not to arrive at all. Competition may be the life of trade, but it is the death of all art, industry and beauty—a sepulchre in which moulder all high ideals, all noble impulses.

The future education will present the questions: "Have you done your best?" "Have you improved the tasks set before you?" "Have you given of your life and strength to help a weaker student?" If the answer be "Yes," be sure that as that student's need is, so shall his strength be also; for back of him will lie every gracious influence in the world that is making for good. With the future education, the presence of the physician or the dentist will be an inspiration, a prayer and its fulfillment; with this all around education we will see disappear the drones, who, as soon as their tools are laid aside, have no resources but to eat and drink and loaf? With them will go the bores and the cranks who can talk of nothing but their own line of business, and in their places will come men who are never bored and who never bore, who enjoy life and are useful members of society, pleasant, helpful companions, ready to lead the world on to higher levels in other lives. Then can man in truth say:

"It matters not how strait the gate,
How charged with punishment the scroll;
I am master of my fate,
I am captain of my soul."



Prof. J. Foster Flagg.

Died, at Swarthmore, Pa., the evening of November 25, 1903, Prof. J. Foster Flagg.

To those who have been aware of his long and serious illness, the above announcement will be no surprise; to many, however, who have but recently read his sprightly articles in the dental journals, it will be a shock. Although he had passed the allotted threescore years and ten, and the frail tenement was beginning to decay, his mental vigor was unabated; he was still keenly interested in those professional matters to which his life's work had been devoted, and his visitors found him as genial, witty and companionable as of old.

Prof. Josiah Foster Flagg was named after his uncle, Dr. Josiah Foster Flagg, a distinguished dentist of Boston, and was a grandson of Josiah Flagg, the first native born American dentist, and was the last male descendant of that branch of the Flagg family.

His great grandfather was Lieutenant-Colonel of Elliott's regiment, attached to the Revolutionary army when it was encamped near Providence, Rhode Island, during the winter of 1781-82. He there became acquainted with Joseph Le Maire, a surgeon dentist from Paris, who was serving as a surgeon to the French troops commanded by Count Rochambeau, and who during this period of idleness had resumed dental practice. His son Josiah, a private in the same command, a youth of about eighteen years, became interested in Le Maire's work, and later became his student, to learn the art and mystery of dental surgery. Thus it was that Josiah Flagg became a surgeon dentist, the first native American to adopt, at the beginning of his career, the dental profession.

The record of the Flagg family begins with Thomas Flagg, who arrived in Massachusetts from Ireland in 1642. In 1797 Josiah Flagg married his second wife, Eliza Brewster, a direct descendant of Elder William Brewster, the leader of the first company of Puritans, who came over in the Mayflower, thus uniting these two old colonial families. The only son of this union was John Foster Brewster Flagg, the father





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of Prof. Flagg, born at Boston May 12, 1804. On the death of Josiah Flagg in the year 1816, the eldest son, Josiah Foster Flagg, who had been educated for the medical profession, and was in medical practice, turned his attention to dentistry and became his father's successor. Upon him devolved the education of his younger brother, who on reaching manhood became a practitioner of dentistry, first in Boston, but soon removed to Providence, Rhode Island. About 1826 he married Miss Mary Waterman Jackson, the daughter of a prominent citizen of that town. Their only son, Prof. J. Foster Flagg, was born October 15, 1828. His early education was at the schools in that town, later at a school in Boston, conducted by Mr. Bronson Alcott. While at this school he learned much from his uncle, and from the frequent visits of his father that did much to mould his professional life. Both of these gentlemen were progressive; they were thoroughly imbued with the true professional spirit and sought to bring about a feeling of brotherhood among fellow practitioners. Prof. Flagg was much impressed with his father's tactfulness in "breaking the ice" when visiting other dentists. He frequently accompanied his father on these visits, and noticed, that if by chance they were unexpectedly ushered into the office, their entrance was followed by a sly putting away or covering up of anything that might tend to unfold professional secrets. His father was usually provided with something new or suggestive which he now brought out, and proceeded to explain. As this was not preceded by any suggestion of a fee, it at first excited surprise, then as it was seen to be a matter of real usefulness, eager attention. When this point was reached, Dr. Flagg needed some little instrument, or perhaps some laboratory appliance, to make the explanation complete, and, presto, the ice was broken. In this way he taught his fellow practitioners the value of mutual confidence, and of mutual interchange of thoughts and ideas. It led, in many instances, to life long friendships, and contributed more than can now be known to professional advancement. The two brothers were at this time interested in making porcelain artificial teeth, and young Flagg was their companion and assistant in their experiments. He is credited with making a fair specimen of dental porcelain when barely past his seventh year. It was, indeed, an excellent school. It early brought into play his natural talent, it gave him a desire to know, and taught him the value of care and persistency in solving difficult problems.

About 1842 his father removed to Philadelphia and quickly became on friendly terms with the leading practitioners of that city and took an active part in events which preceded the organization of a dental association and later a dental college. On completing his schooling, J. Foster



Flagg entered the Jefferson Medical College, of Philadelphia, but on account of his youth did not graduate. About 1849, on the discovery of gold in California, provided with instruments, and a well stocked medicine chest, so as to be able to practice medicine or dentistry, he proceeded to the Pacific Coast. During the seven years he remained he had varied experiences. At one time at the gold digging, again on a ranch as a cowboy, and later engaged with a few enterprising companions in constructing a dam to impound the waters of a mountain stream for mining and other purposes. This was the first attempt to control these turbulent waters, and the pioneer effort in that which has done so much to develop the industries and resources of that region. At times it was a hard and wild life, full of danger and excitement. It was, however, thoroughly enjoyed by Dr. Flagg. His dental and medical skill was now and again brought into play, and aided by his natural resourcefulness, they proved of great use to his companions. The much dreaded Asiatic cholera during this period visited the Pacific Coast. The untoward sanitary conditions found in mining camps made it particularly fatal. Dr. Flagg urged the adoption of proper precautions, and by his aid and council did much to stay its progress.

While engaged in his engineering project, his mother's serious illness called him home, and he returned, serving on the passage from San Francisco to Panama as physician.

On returning to Philadelphia he decided to devote his attention to dentistry and entered the Philadelphia College of Dental Surgery, graduating from that institution February 29, 1856. For a few years he practiced in New Jersey; returning to Philadelphia he located with his father at 1112 Arch Street in 1860. October 31, 1861, he married Miss Mary Craft, who survives him.

He was fortunate in quickly acquiring a satisfactory practice. His genial disposition, his professional skill and his gentleness in operating gave him a firm hold upon his patients. By prudently providing during the active part of his life for the "rainy day" that will surely come, he was able, when advancing years made professional duties a burden, to retire to his comfortable country home at Swarthmore. Here, relieved from care, with congenial neighbors and his family around him, he enjoyed for a few years a well earned rest. Such a man as was Dr. Flagg could not remain idle. He occupied his time superintending the manufacture of the various plastic filling materials he had done so much to improve, and in experiments looking to their still further increased usefulness. This he did not relax until the inroads of disease made it impossible. He truly died in harness.



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Dr. Flagg in Societies.

Dr. J. Foster Flagg entered the dental profession with a determination to succeed. He was enthusiastic, energetic and a tireless worker. He possessed to a high degree the true professional spirit, believing that any good thing tending to lessen human suffering should be widely known. He promptly became a contributor to periodic dental literature, and continued to write until his hand was no longer able to guide a pen. While his style was not scholarly, it was expressive, forceful, and interesting. He skilfully used sarcasm and wit to emphasize telling points in argument, so carefully combined, however, as to be inoffensive and enjoyable, even to those who felt his thrusts. He was quite at home in controversy, offensive or defensive, and had the happy faculty of bringing on a hearty laugh, as oil upon troubled waters, when the battle waxed too hot. In speaking or writing, he entered into and continued controversy as a means of bringing out truth and correcting error; and was quick to detect and bold to expose the weak points of an argument. But little from his pen has been put in book form; he dealt mainly with the passing questions of the hour and realized the difficulty of logically arranging and properly recording for permanent use matters constantly changing.

Dr. Flagg was not an enthusiastic dental society man. On professional matters he was so often in opposition with accepted ideas, that, as he often remarked, he seemed to be a professional heretic. He had noted with keen regret that professional societies held tenaciously to accepted theories and methods; and too often were intolerant with those who called these into question, notwithstanding that it is only by so doing that progress is made. Dr. Flagg was progressive; he was constantly looking for something better; he wanted to know more of the why and the wherefores of dental theory and practice, and considered his own experience and observations of more value to *him*, than the *ipse dixit* of men long dead. He denied the right of any body of men to dictate what should and what should not be considered accepted practice, especially in a profession like that of dentistry, which had seen so many changes, and still had so many problems to solve. He recognized fully the importance of associate effort, and how essential to professional advancement dental societies were, and keenly regretted that his habit of "thinking aloud," of telling all he knew before others "caught on," so often placed him *in front* of the "firing line" that he had come to hold his membership in dental societies ever ready to "slip his moorings," to escape expulsion, for doing too soon what "all the other fellows would be doing a little later," as he facetiously put it. No one, however, enjoyed more than did he meeting his fellow practitioners, or was more ready to



take part in society work. And none more welcome, appreciated or listened to with more attention; nor, it may be added, more *severely criticized*, even *reproached*. To his credit, be it said, he took all in good part; "it's medicine one has to take when going too fast," he said, and he took it kindly.

**Dr. Flagg
as a Teacher.**

Dr. Flagg began his career as a dental teacher with the first faculty of the Philadelphia Dental College, at its organization in the spring of 1863, and was the last survivor of that little band. His chair was first entitled "Institute of Dentistry," but was later changed to that of "Dental Pathology and Therapeutics," a change in name only. He resigned at the close of the seventh session, continuing his connection with the college, however, as a clinical instructor. At the opening of the seventeenth session, 1879-80, he resumed his former position and continued to lecture until the session of 1895-6, when he finally retired. During this later period, about 1887, the college united with the Medico-Chirurgical College in the erection of a building for joint occupancy, as an economical means of securing better accommodation for their increasing classes. Dr. Flagg had much to do with designing the new structure, and skilfully planned the various rooms so as to secure the largest capacity without sacrifice of desirable convenience. He superintended their construction, and with the skill of a trained architect met and solved the many problems that arose as the building progressed. The finished structures proved eminently satisfactory and well suited for their intended use.

As a teacher he displayed marked ability. His personal magnetism, his enthusiasm and his earnestness held the students' attention. He spoke with energy and emphasis, and enlivened his discourses with witty sayings and anecdotes, appropriate and well told. The prosy recitals of science were enforced by recounts of personal experience and observation, and wherever possible by telling demonstrations. To assist in this, he invented various models and devices, among them a rude representation of the head, with the jaws and teeth in position, for the purpose of illustrating desirable positions for operating, the use of napkins, bandages, etc. This, much to the Doctor's amusement, was duplicated and patented in England as something new, a score of years after he had introduced it to his classes.

**Dr. Flagg as
an Investigator.**

Dr. Flagg's best work for the profession, and his most lasting and far-reaching, was as an investigator. First, in connection with his father, and the late Prof. Thos. L. Buckingham, to determine the *role* of arsenic as a dental therapeutic agent. While this was not conclusive, it led to a better understanding of its value, and to methods which



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safeguarded its use, and made it more effective. His experiments in connection with plastic fillings attracted greater attention and promises to have more lasting results. Very early in his experience as a dentist Dr. Flagg became dissatisfied with the results obtained by the best methods of tooth-saving then in vogue. The saying, so frequently repeated by operators of well established professional reputation, "A tooth that could be filled at all, can be filled with gold," did not impress him as a proper statement of the question. What could be done, depended very much upon the operator's skill. To him, after seeing many failures on the part of excellent operators to save carious teeth for any length of time with gold fillings, it seemed more to the point to ask, not, what *can* be done, but what is *best* to do. He found many teeth that he could not fill with gold, and he found many teeth that had been so repeatedly filled with gold that it could be no longer used, and yet these teeth, it seemed to him, were far more useful to their owners than would be artificial substitutes. He moreover found that teeth so far destroyed by caries that gold could not be used, at times, when filled with amalgam, outlasted better teeth in which gold had been placed. He was not satisfied that accepted methods of dental practice were doing, in the way of tooth-saving, all that could be done. He adopted as his motto, "Any tooth that can be made comfortable and useful is worth saving," and could not see why any means contributing to this end should not be considered reputable practice.

He was far in advance of his times in this.

The New Departure. Using gold in all cases where it seemed to do for the teeth all that could be done, he began the use, cautiously, of the much despised amalgam in cases where gold had not proved a satisfactory decay arrester. He quickly noted the many deficiencies of amalgam and began at once an inquiry as to the cause and the remedy. It was not long before he observed that accuracy of adaptation to cavity walls, while essential when gold was used, was not so quickly followed by recurring decay in the case of tin, amalgam, and the non-metallic fillings. Why was this? He was puzzled.

In the early seventies, Dr. Chase, of St. Louis, and Dr. S. B. Palmer, of Syracuse, N. Y., both of whom had been working with Dr. Flagg in these researches, suggested that there was an incompatibility between gold and the substance of the tooth, or *dentos* (a term used for convenience). They suggested, that as gold and *dentos* were widely separated electro potentially, a leaking gold filling became a galvanic battery, and the galvanic current thus generated so changed the fluids in its immediate neighborhood that they became tooth-destroying agents. Furthermore, in many cases those where the teeth were denominated "soft," and in mouths where



the teeth are especially prone to decay, they contended that this action took place between gold and dentos where no defect at the cavity margin existed. In other words, there were cases where gold was an unsafe filling to use because it was gold, not because of any want of skill or care on the part of the operator. The fillings which proved better tooth savers in such cases owed their efficiency, not to their being more plastic, and therefore more readily made to thoroughly fill the cavity, but to the fact that they were, electrically, more in harmony with tooth structure or dentos. This constituted the "New Departure" which Dr. Flagg announced in an address to the profession at a special meeting of the Odontological Society of New York November 20 and 21, 1877. Endorsed as it was by men of established reputation, and supported by an array of undisputed facts, skilfully arranged and presented, it at once elevated the plastics from the realm of quackery to that of reputable practice. The use of plastics was no longer a confession of weakness, it was no longer a reproach; it was "scientific." This was not, however, generally admitted. While the facts presented were indisputable, it was contended by the opponents of this new theory, that the deductions drawn from them were unwarranted, and Dr. Flagg and his colaborers were roundly denounced. Nevertheless, no one thing has made a more marked or lasting impress on dental practice than did this address of Dr. Flagg, and however we may feel toward the theory, or the practice advised, it has, undoubtedly, vastly increased the ability of the dental profession as tooth savers. It has stimulated as nothing else could, the improvement and use of the plastics, and this in turn has made available methods of tooth saving long known but useless for want of that which this has provided. Let this be placed to Dr. Flagg's credit. With all due honor to his colleagues, who but he could have so forcefully presented it? Who but he had the courage?

None but those close to Dr. Flagg can appreciate the enormous labor and the deal of time he expended in his amalgam experiments; few indeed know his methods. He first began by noting the difference between the behavior of different amalgam fillings. Selecting the alloy which seemed the most promising, he endeavored to determine wherein its excellence lay. With this as a guide, his next effort was to determine the exact value of each available metal, how it was affected by alloying with other metals, and the best proportions. In order to determine these points, he selected a number of skilful, unprejudiced operators known to him to be close observers, and who were located far apart. From time to time he distributed to these portions of alloys with instructions regarding their manipulation, requesting reports of the fillings made from them after a long interval, especially in regard to tooth saving, integrity,





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and color; and further requested that these reports be modified should the later condition of the fillings call for it. Having a record of the formula of the alloy and the treatment it received before it left his hands, when these reports were received and collated, he had exact data from which to determine its value. After a score of years of this work, about 1881, he was satisfied to publish the results in his work entitled "Plastics and Plastic Fillings," and by subsequent editions and corrections he has kept the profession informed of the progress made. He kept this up until within a few months of his death, a period of more than forty years.

Seldom, indeed, has three successive generations been so closely identified with the rise and progress of a profession as have the Flaggs, father, sons and grandson. The father a pioneer; the sons honored exponents of the science, each in his own field making a praiseworthy mark; while the grandson, in labor performed and results accomplished, eclipsed them all. With his death the chapter ends. He was the last of his race.

W. T.

Mr. William Ash.

Born April 18, 1819; died November 19, 1903.

We regret to announce that Mr. William Ash, the youngest son of Claudius Ash, the founder of the firm of Claudius Ash & Sons, died at his London residence, Tower House, Camden Road, N. W., on Thursday, November 19, in his eighty-fifth year. Born in the parish of St. James's, Westminster, on the 18th of April, 1819, he was educated in London, and in due course joined his father and his brothers, George Claudius and Edward, in business.

For nearly sixty years Mr. William Ash was a familiar figure at Broad Street, and all who remember him will recall his kindly and urbane manner. He ceased to take an active part in the business about ten years ago.

In addition to the business side of his life, Mr. William Ash was deeply interested in the dental profession and was very closely associated with the Dental Hospital of London from its inception. For a great many years he was an active member of the Committee of that Institution, and took a prominent part in its removal from Soho Square to Leicester Square, the result of a proposal by Mr., afterwards Sir Edwin Saunders. At the annual general meeting of the Governors of the hospital in 1873, Mr. Ash proposed an alternative to the Saunders' plan.



"His idea was to build suitable premises, rather than to convert old ones into the nearest approach to convenience they would allow. At considerable trouble he had procured plans and drawings in connection with sites to be obtained from the Metropolitan Board of Works, on which a hospital could be erected, adapted in all points to the requirements of the managing and medical staff, the students, and also the Odontological Society. * * * His proposal was discussed, but eventually the decision was given in favor of the original plan."*

Soon after his twenty-first birthday Mr. William Ash married Sarah, the daughter of Mr. James Matchwick, of Guildford, Surrey, who predeceased him by only sixteen days.

Three years ago a stained glass window was inserted in the church at Heathfield, Sussex, in which parish Mr. Ash had a country residence, as a thank-offering, and in commemoration of his Diamond Jubilee.

Mr. William Ash leaves three sons and three daughters. Of the sons William Henry and Claudius James are at present the senior directors of the firm of Claudius Ash & Sons, Limited.

The funeral took place on Monday, November 23, at Highgate Cemetery and was largely attended by members, relatives and friends of the family, also by many of the employees at Broad Street and some from the factory at Kentish Town.

Dr. J. A. Balentine.

Dr. J. A. Balentine, of Jonesboro, N. C., died on August 21 in his forty-fifth year. He was a graduate of the Baltimore Dental College, class of 1882. He was a member of the North Carolina State Dental Society.

Dr. Jonathan Taft.

By the death of Dr. Jonathan Taft, the dental profession loses one of its most representative members, and one of its most earnest workers.

A man of high ideals, as shown by his exemplary career, he carried his principles into his daily work and never faltered in his efforts to elevate and advance the status of dentistry.

Having been connected with dental educational institutions as pro-

*Hill's History of the Reform Movement in the Dental Profession in Great Britain, page 237.



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fessor or dean since 1854, he knew the needs and weaknesses of the growing profession of which he was such an able representative, and through his teachings and writings his influence has been felt.

Beloved and respected alike by students and practitioners wherever he was known, he leaves a noble record. The profession to which he has unselfishly devoted so many years of his life is better for his having lived, and now that his work is done, we mourn his loss and tender our sincere sympathy to Dr. Taft's family in their bereavement.

Resolved, That this minute be spread in full upon the records of this society and a copy be sent to Dr. Taft's family and also to the dental journals.

Signed: WM. JARVIE,
A. L. NORTHROP,
W. D. TRACY,
Committee.





BOOK REVIEWS

Principles and Practice of Crowning Teeth.

By HART J. GOŚLEE, D.D.S., Chicago, Ill.

New York: The Consolidated Dental Mfg. Co.

London: Claudius Ash & Sons (Limited).
1903.

In the preface of this work the author speaks of the gradual and steady growth of the science of crown and bridgework from its earliest history down to its usefulness of the present day.

The average practitioner, educated in other branches of his profession with an abundance of patronage in his chosen line, is unable to keep pace with an art that is making great inroads into his especial department, and it is but a question of time when such a dentist finds it to his advantage, if not imperative for him to familiarize himself with crown and bridgework.

To such end this book is written as a ready reference, giving the diagrams and technique of the different methods and an opportunity to make a selection best suited for his individual case.

The author also claims that a great incentive has thus been given to dentistry by opening fields for higher artistic conceptions and causing thereby an elevation of the profession.

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From the dental literature of the 18th century in which methods of applying pivot teeth to roots are found, the ultimate development of crown and bridgework is purely a product of the 19th century, and American dentistry has the credit.

In the first chapter a history is given of the development of the art of crowning teeth, from the first mention of a pivot tooth in Fouchard's work in 1728, down to the present day. It gives in progressive steps a minute description of each method, the name of the inventor, the year in which they were used, and when patents were given, the year they were issued, and to whom granted. From this it is shown that undesirable methods have been discarded, and only those of merit have been retained. Chapter II, under the head of Metals, Alloys and Solders, is a most excellent treatise on metallurgy. Under this head is given a table illustrating the heat and color necessary in tempering the various kinds of instruments, methods and formulas for refining gold, making platina solder, gold solder, refining scrap gold, and for fusible metals.

Chapter IV is devoted to investments and investing materials, which covers the usual methods, in detail.

Under the head of Soldering, thirteen pages are devoted to the minutest detail of using gold, platinum and soft solders, with or without investment. While there is nothing essentially new under this head, the subject is so beautifully presented step by step that it cannot but be instructive to those who have not done much soldering, and to those who are familiar with the subject it will be entertaining.

On page 60 is the description of a method for paralleling converging or diverging teeth for abutment crowns, by the use of carborundum wheels. While it is the customary procedure to cut the approximating surfaces until they are parallel, there are many nervous patients who are unable to endure this procedure, and there are several other good methods, not given in this work, that do not require it.

In this chapter is also advocated the devitalization of pulps for anchorage, with explicit reasons for doing so, and in the light of past experience the author's arguments are good.

In this chapter also is given the technique of the "Jacket Crown" which, however, is more fully demonstrated on page 238 under porcelain work, and is deserving of especial credit for its simplicity and evident usefulness.

Also a unique method of banding badly broken down roots, supplying lost tissue with amalgam and subsequently crowning them.

An article on perforated roots and fractured teeth is most excellent, and the methods seem adequate for the successful restoration of any fracture of that nature. The remainder of the book is devoted to the



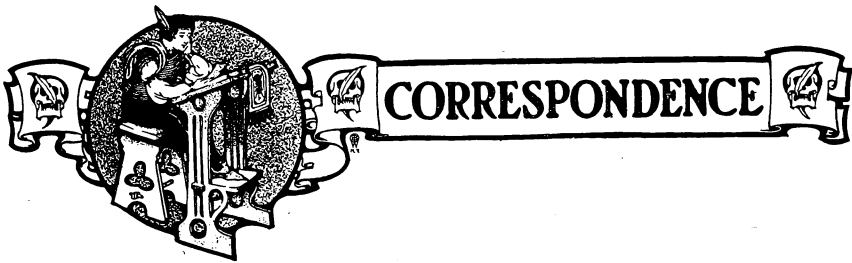
BOOK REVIEWS

"composition, characteristic and manipulation of porcelain bodies," the "application and construction of porcelain crowns," the different kinds of furnaces, the technique of baking, and the insertion of gold filling in artificial teeth.

Under the head of baking porcelain a very valuable table is given, showing the fusing point of the different makes of bodies with current (volts), rheostat, time and degree of heat.

This book is deserving of great commendation, is indispensable to those not familiar with this kind of work and should be in every dental library.

R. C. B.



Letter from Dr. Jenkins.

To the Editor. of ITEMS OF INTEREST:

Sir—In the September number of the *Dental Review*, I have just read, upon page 871, a statement made by Dr. Ottolengui, in the discussion of his paper read at the fifteenth anniversary celebration of the Odontographic Society of Chicago, February, 1903, that "Dr. Jenkins is about to introduce a high fusing porcelain which will have all the qualities of this low fusing porcelain."

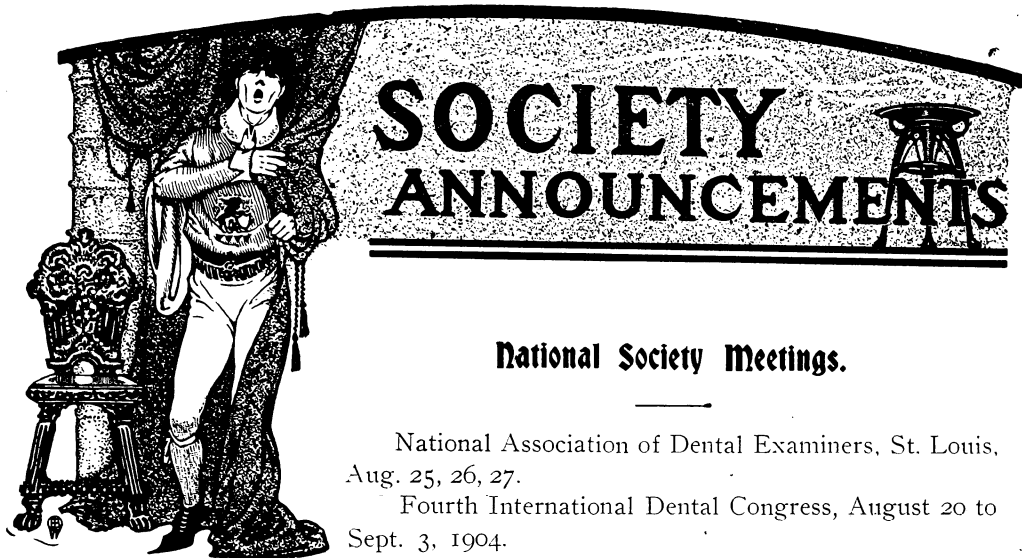
Permit me to say that this statement has been founded upon a misconception. For this misconception I am, however, responsible. In a letter to Dr. Ottolengui, written during frequent interruptions, I mentioned that I was about completing a new porcelain enamel for crown and bridge work and continuous gum, and that it melted at a somewhat higher temperature than porcelain enamel for inlays, although still below the melting point of gold. Doubtless I failed to accentuate the exclusive character of the new body and gave my correspondent an incorrect idea of its purpose.

I have never thought of making a high fusing porcelain for inlays or for any other purpose. It has been my object to produce a body which, through temperatures and refinements unemployable in other methods, should make porcelain restorations more easy and certain to the general practitioner. It would, therefore, have been a stultification of the labor of years for me to have essayed the comparatively simple task of producing a high fusing body, as well as a work of supererogation, since there already exists a sufficient number of excellent products of this nature.

I am, sir, with great respect,

Yours very truly,

N. S. JENKINS.



National Society Meetings.

National Association of Dental Examiners, St. Louis,
Aug. 25, 26, 27.

Fourth International Dental Congress, August 20 to
Sept. 3, 1904.

State Society Meetings.

California State Dental Society, San Francisco, May 16, 17, 18.

Connecticut State Dental Association, Hartford, April 19, 20.

Delaware State Dental Society, February 3.

Florida State Dental Society, Atlantic Beach, May 25.

Illinois State Dental Society, Peoria, May 10, 11, 12.

Indiana State Dental Association, Indianapolis, June 28, 29, 30.

Maine Dental Society, Bangor, July 19, 20, 21.

Minnesota State Dental Association, St. Paul.

Mississippi Dental Association, Jackson, April 19, 20, 21.

New Jersey State Dental Society, Asbury Park, July 21, 22, 23.

New York State Dental Society, Albany, May 13, 14.

North Carolina Dental Society, Morehead City, June 22-25.

Utah Dental Association, Salt Lake City, April 4.

Vermont State Dental Society, Montpelier, March 16, 17, 18.

Washington State Dental Society, Seattle, May 26, 27, 28.

Wisconsin State Dental Society, Manitou, July 19-21.

The Florida State Dental Society.

The twenty-first annual meeting of the Florida State Dental Society
will be held at Atlantic Beach, May 25, 1904.

SOCIETY ANNOUNCEMENTS

List of standing and special committees, 1903-4:

Operative Dentistry—Dr. J. D. L. Tench, Gainesville, Chairman; Dr. Edith R. Brush, Daytona, Secretary. Mechanical Dentistry—Dr. F. E. Buck, Jacksonville, Chairman; Dr. Jas. W. Simpson, Kissimmee, Secretary. Physiology and Etiology—Dr. W. E. Driscoll, Braidentown, Chairman; Dr. Henri Letord, Orlando, Secretary. Dental Education and Literature—Dr. W. G. Mason, Tampa, Chairman; Dr. W. S. Taylor, De Land, Secretary. Essays and Voluntary Papers—Dr. C. H. Frink, Fernandina, Chairman; Dr. R. L. McMullen, Clear Water, Secretary. Pathology and Surgery—Dr. L. C. Elkins, St. Augustine, Chairman; Dr. G. Enloe, Miami, Secretary. Dental Histology and Microscopy—Dr. T. J. Welch, Pensacola, Chairman; Dr. R. M. Mason, Sanford, Secretary. Dental Chemistry and Therapeutics—Dr. A. B. Whitman, Orlando, Chairman; Dr. E. A. Law, Bartow, Secretary. Clinics—Dr. C. C. Collins, Atlanta, Ga., Chairman; Dr. W. McL. Dancy, Jacksonville, Secretary. Arrangements—Dr. Jas. Chace, Jacksonville, Chairman; Dr. E. M. Sander-son, Jacksonville, Secretary; Dr. F. E. Buck, Jacksonville.

Special Committees: To Investigate Illegal Practice—Dr. W. G. Mason, Tampa, Chairman; Dr. T. J. Welch, Pensacola, Secretary. To Revise the Constitution and By-Laws—Dr. C. F. Kemp, Key West, Chair- man; Dr. J. E. Chace, Jacksonville, Secretary; Dr. L. C. Elkins, St. Au- gustine.

NOTE: This committee was appointed to draft a new Constitution and By-Laws more in accord with present needs. Members of the Society are urged to make such suggestions to the chairman as may occur to them.

List of officers: President, Dr. J. Edward Chace, Ocala, Fla.; First Vice-President, Dr. A. B. Whitman, Orlando, Fla.; Second Vice-Presi- dent, Dr. R. L. McMullen, Clear Water, Fla.; Secretary, Dr. D. D. Beek- man, Daytona, Fla.; Treasurer, Dr. F. B. Hannah, Jr., Jacksonville, Fla. Executive Committee: Dr. Jas. W. Simpson, Kissimmee, Fla.; Dr. Jas. E. Chace, Jacksonville, Fla.; Dr. A. J. Hannah, Umatilla, Fla.; Dr. G. Enloe, Miami, Fla.; Dr. A. B. Stevens, Orlando, Fla.

NOTE: It is urgently requested that all members, whether on a com- mittee or not, will contribute papers or clinics, communicating their wil- lingness to the chairman of the committee to which they wish to be assigned.

Any suggestions which will help to make our next meeting a success will be gladly received by the President or Secretary.

J. EDWARD CHACE, D.D.S.,
President.

D. D. BEEKMAN, D.D.S.,
Secretary.





New York State Dental Society.

The thirty-sixth annual meeting of the New York State Dental Society will be held at Albany May 13, 14, 1904. A full programme will appear later.

W. A. WHITE, Secy., Phelps, N. Y.

R. H. HOFHEINZ, President, Rochester, N. Y.

Pennsylvania Association of Dental Surgeons.

The fifty-seventh annual meeting of the Pennsylvania Association of Dental Surgeons was held at the Continental Hotel, Philadelphia, on Tuesday evening, October 10, 1903. After the reading and discussion of papers, the following officers were elected for the ensuing year: President, Wilbur F. Litch; Vice-President, M. I. Schamberg; Secretary, J. Clarence Salvas; Treasurer and Librarian, Wm. H. Trueman.

J. CLARENCE SALVAS, Secy.

Wisconsin State Board of Dental Examiners.

The next meeting of the Wisconsin State Board of Dental Examiners for examination of candidates desiring license to practice dentistry in Wisconsin will be held in Milwaukee, at Hotel Pfister, Jan. 25, 1904.

Application must be made to the Secretary fifteen days before examination. Candidate must be a graduate of a reputable dental college or have been engaged in the reputable practice of dentistry consecutively for four years or an apprentice to a dentist engaged in the reputable practice of dentistry for five years.

J. J. WRIGHT, D.D.S., Secy.

1218 Wells Building, Milwaukee, Wis.

Delaware State Dental Society.

The Delaware State Dental Society will meet on Wednesday, February 3. Place of meeting has not been decided on as yet.

Wilmington, Del.

R. H. JONES, Secy.



Alumni Association of the Northwestern University Dental School.

The annual clinic of the Alumni Association of the Northwestern University Dental School will be held at the University Building, corner of Lake and Dearborn Streets, Chicago, on January 19, 1904.

All members of the profession are cordially invited to attend.

G. B. MACFARLANE, D.D.S., Secy.,
70 State Street, Chicago, Ill.

E. B. JACOBS, D.D.S., President.

Ohio State Dental Society.

The following is a list of officers elected at the thirty-eighth annual meeting of the Ohio State Dental Society: President, J. F. Stephan, Cleveland, Ohio; 1st Vice-President, W. T. McLean, Cincinnati, Ohio; 2d Vice-President, H. T. Ambler, Cleveland, Ohio; Secretary, S. D. Ruggles, Portsmouth, Ohio; Treasurer, C. I. Keely, Hamilton, Ohio.

Portsmouth, O.

S. D. RUGGLES, Secy.

Fraternal Dental Society of St. Louis.

The Fraternal Dental Society of St. Louis elected the following officers at its December meeting: Dr. E. E. Haverstick, president; Dr. W. E. Brown, vice-president; Dr. E. P. Dameron, recording secretary; Dr. J. A. Todd, corresponding secretary; Dr. S. T. Bassett, treasurer; Dr. B. L. Thorpe, chairman; Dr. W. L. Whipple and Dr. G. H. Matthae, Executive Committee.

JAMES A. TODD, Secy.

St. Louis, Mo.

Missouri State Dental Association.

At the thirty-ninth annual meeting of the Missouri State Dental Association, held at Kansas City, May 19-21, 1903, the following officers were elected: President, J. H. Kennerly, St. Louis; first vice-president, F. W. Franklin, Kansas City; second vice-president, F. H. Achelpohl, St. Charles; recording secretary, H. H. Sullivan, Kansas City; corresponding secretary, S. T. Bassett, St. Louis; treasurer, J. F. Fry, Moberly.





ITEMS OF INTEREST

Board of Census—J. C. Pasqueth, Mexico; A. L. Bridgeford, Macon; De Courcey Lindsley, St. Louis.

Committee on Ethics—J. B. McBride, Springfield; J. A. Prosser, St. Louis.

Committee on Publication—W. G. Goodrich, Chillicothe; Otto J. Fruth, St. Louis.

Committee on Appliances—J. F. Austin, St. Louis.

Place and time of next meeting, St. Louis, third Tuesday in May, 1904.

Respectfully,
SAM. T. BASSETT,
Cor. Sec'y.

New Haven Dental Association.

At the annual meeting of the New Haven Dental Association, held Dec. 8 in New Haven, the following officers were elected: President, Dr. F. W. Brown; Vice-President, Dr. E. S. Gaylord; Secretary, Dr. E. Frank Cory; Treasurer, Dr. H. A. Spemy. Executive Committee: Dr. J. Tenney Barker, chairman; Dr. A. F. Slater, Dr. F. C. Parsons. Finance Committee: Dr. E. S. Thompson, Dr. G. E. Nettleton, Dr. H. S. Nichols.

It was also voted to hold a convention in New Haven in March, the dates of which will be announced in the next issue.

Reunion of Class of '91, N. Y. C. D.

A reunion of the above class will be held in New York on January 30, 1904. A large representation is desired at the dinner and letters are requested from all members unable to attend which will be read.

For information communicate immediately with Dr. W. H. McCutcheon, Crescent Club, Brooklyn, N. Y., or Dr. W. D. Provost, 352 Stuyvesant Avenue, Brooklyn, N. Y.

